Telephony.

THE AMERICAN TELEPHONE JOURNAL

Successor to Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone Sound Wave

PUBLISHED WEEKLY BY TELEPHONY PUBLISHING CORP.
608 S. Dearborn St., CHICAGO

H. D. FARGO, President and Treasurer
S. R. EDWARDS, Editor and Secretary

H. D. FARGO, Jr., Vice-President and Advertising Manager
D. C. SORENSEN, Western Advertising Manager

Entered as second-class matter September 4, 1908, at the postoffice at Chicago, Ill., under act of March 3, 1879.

Volume 99
Number 4

CHICAGO, SATURDAY, JULY 26, 1930

Subscription — 10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

TELEPHONE BUSINESS ADVANCING DESPITE THE DULL TIMES

Financial writers and business observers hold a profound respect for the telephone industry because of the showing it is making this year, despite slow conditions in general business. Corporations in most other lines are reporting decreased earnings for the first six months of 1930, while telephone companies are able to show an advance, although the gain is less, of course, than in more favorable years.

Records of the Interstate Commerce Commission show that there were 105 telephone companies reporting to that body, each having annual operating revenues in excess of $250,000. At the close of business April 30 these companies had 17,071,003 stations in service, as compared to 16,279,252 on the same date in 1929, which was a gain of 791,751 telephones, an increase of 4.9 per cent.

Operating revenues were $391,607,322 for the first four months of 1930, an increase of $19,322,631 a gain of 5.2 per cent. Net revenues for the month of April showed a gain of 6.1 per cent, which was an improvement over the preceding months of the year.

* * * *

There also has been a noticeable improvement in recent weeks, and the next I. C. C. report is expected to show even better conditions. Compared to other industries—and this includes the other public utilities—the telephone business is justifying the theory that it is stable and thriving regardless of the fact that general business is on levels below 1929.

Long distance telephone revenues continue to increase, the commission figures showing that for the month of April alone the receipts for message tolls for the 105 companies amounted to $27,356,459, a gain of nearly 3 per cent over the same month in 1929. Tolls for the second quarter will also show an increase over the first quarter of 1930.

* * * *

The six-months' report of President Gifford of the Bell organization showed a net income of $81,671,847, as against $80,102,038 for the corresponding period of 1929, which is about 2 per cent gain. Earnings per share of American T. & T. stock were $5.71 to June 30, 1930, compared to $6.15 a year ago on 1,280,228 fewer shares.

President Gifford reports that 165,000 telephones were added to the Bell system during the six months, and notes that the number of long distance messages has continued greater than last year, and he adds that the gain during the second quarter of 1930 was larger than that of the first quarter. Expenditures by telephone companies for the extension of plant are running far ahead of 1929.

Telephone companies all over the country are doing their full share to speed up business and are carrying on building programs that will stimulate business industry and put money in the hands of wage-earners.

Supplying jobs and giving the army of workers an income to spend is the quickest way to insure good times. The big, greedy corporations that lay off employes and cut wages in order to protect stockholders' dividends are delaying the return to prosperity.

Corn Belt Wisdom.

Not all the wise business advice comes from the neighborhood of Wall Street and Big Business. Here is a shrewd analysis of the situation from the Daily Pantagraph, published at Bloomington, in the corn belt of Illinois, which hits the nail on the head:

"Much is said and written in these days about overproduction. This is not applied to the agricultural situation solely, but many industrial lines are said to be overproducing. It might be made to appear that the people of the United States are not buying as formerly because they have no need of the commodities which they formerly needed. But this is far from true.

There is at our very doors a huge potential market for American products which should be used to turn the tide of business upward toward a return of prosperity before very long.

Over seven million families in the United States have no automobile. There are 20 million families which have no adequate radio sets. In the cities alone, not counting the farm population, there were in 1928 four million families which have no bath tubs for their homes; and over three millions of families without even a kitchen sink with running water, and probably no plumbing for their houses.

There are 13 million families in the coun-

try without any kind of a telephone and four million homes not wired for electricity.

Over-supplied? It is said that five million families in this country are without proper or adequate clothing, food or housing. These are eager to secure better living conditions, and would purchase the necessary things to give them this kind of life if they had the money to do so.

The country is not, therefore, overstocked with things which people want and need. Give the people wages, income, money to buy them, and there would be a rush of orders for every producing institution in the country."

Merit vs. Pull.

Political jobs, as a rule, are given to those who have political influence. Their fitness for the work is usually a secondary consideration. They get the appointments because they have "pull" or "drag." In Chicago, for instance, automobile drivers who have police stars on their cars are called members of the "I Gotta Drag" club.

These stars were supposed to bring them privileges not given to other car-owners, but the custom is falling into disrepute. Too many bootleggers and gangsters were flaunting the special privilege stars.

In business, family influence is also dying out as a means of holding the incompetent in good positions. Speaking to the graduating class of Armour Institute, B. E. Sunny, who has just retired as chairman of the Illinois Bell Telephone Co., made this statement:

"Wealthy or influential friends sometimes help some in whom they are interested to a position, but merit only will keep him there. It is rarely ever the case that a man goes from one position to a higher one for any other reason than that he has won it fairly."

Mr. Sunny has had a wide and successful experience in large affairs of business, and the young man starting out in life should bear his observation in mind.

COMING CONVENTIONS

Wisconsin State Telephone Association, Hotel Schroeder, Milwaukee, August 5, 6 and 7.

Independent Pioneer Telephone Association of United States, Hotel Stevens, Chicago, October 16.

United States Independent Telephone Association, Hotel Stevens, Chicago, Ill., October 14, 15, 16 and 17.

Illinois Telephone Association, Pere Marquette Hotel, Peoria, November 12 and 13.

The Maintenance of Distributing Frames

Where Faults May Occur—Inspecting Framework—Jumper Wire Suggestions—Soldering—Care of Protectors—Inspection of Frame Ground Necessary—Required Cable Record—Value of Neatness in Main Frame Room

By T. De Witt Talmage,

Transmission Engineer, Illinois Telephone Association, Springfield, Ill.

An analysis of telephone service inspection reports indicates a large amount of criticism directed at the condition of the distributing frames in telephone exchanges. This condition seems to be quite general and is especially noticeable in the smaller exchanges. These criticisms include not only faults which are causing trouble at the present time but also such conditions classed as potential faults; that is, faults which may cause trouble and inconvenience at some future time.

A further study of these reports shows that the majority of the faults are simply due to negligence, carelessness and hasty workmanship and are easily remedied. The improvement of these conditions can be accomplished by merely giving the distributing frame its due share of attention from the standpoint of inspection and maintenance.

In an article entitled "Telephone Work Notes That Pay Interest," published in TELEPHONY of January 4, 1930, there was a section devoted to the inspection of distributing frames which caused much favorable comment. After reading that article, it was stated by a well-informed telephone executive that there was a definite need for more information in a convenient form regarding the necessary care of distributing frames. In the interest of better operating methods it would seem, therefore, that some suggestions concerning distributing frame maintenance would be helpful.

In order to intelligently plan the repairs of the distributing frame, an inspection of the equipment is first necessary. It is the intention of this article to expedite such an examination by pointing out the most prolific sources of distributing-frame trouble. For that reason this article lists the items to inspect, suggestions for inspection methods and instructions concerning the improvement of undesirable conditions which tend to lower the grade of telephone service and increase maintenance costs.

"Not Only the Frame but the Floor Under and Around it Should be Kept Clean," Says Mr. Talmage. "Neat Work Should not Only be Done for the Sake of Appearance, but Because Neat Work is the Direct Result of Careful Work."

Where Faults May Occur.

Each telephone line must terminate in certain central office equipment for signaling and switching purposes. Each central office, therefore, has inside line equipments to which outside lines can be connected.

It is necessary that facilities be provided so that any outside line may be connected with any inside line. For this purpose terminals are required for both outside and inside lines. These terminals are usually mounted on a steel frame, called a distributing frame, which is so constructed as to facilitate the connection of any outside line terminal to any inside line terminal.

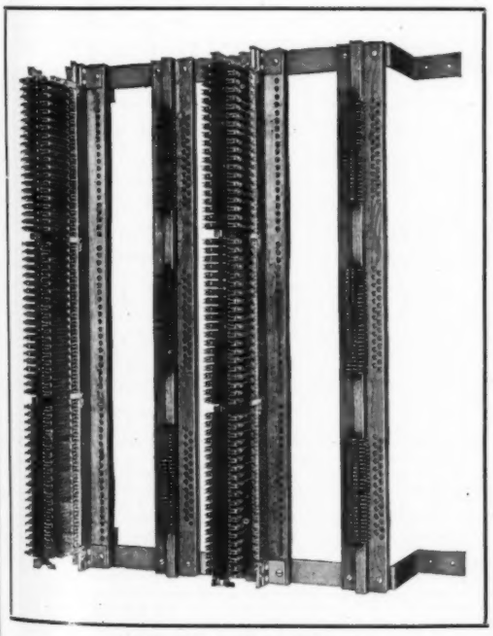
Therefore, the purpose of a distributing frame is to provide a convenient means for cross-connecting the terminals of the outside line cables with the inside switchboard circuits. The short lengths of flameproof wire used for this purpose are generally known as "jumpers" or jumper wires. Experience indicates that a great many

transmission troubles locate in this part of the central office equipment.

All outside lines which may be in any manner subject to electrical hazards are usually provided with carbon-block air-gaps leading to earth, as well as heat coils or fuses or some combination of these protective devices. Many times these protectors are compactly mounted on steel plates which are attached in the vertical position on one side of the distributing frame in order that the jumper wires may be as short as possible. To insure proper operation of protectors it is essential that they be inspected periodically and any defects found corrected promptly.

Terminal blocks, consisting of metal terminal lugs embedded in hard rubber mounted on maple fanning strips, are attached to the side of the distributing frame opposite the protectors. They may be either singly in the vertical position or so as to form continuous rails in the horizontal position. Both protectors and terminal blocks serve as terminals for lines. In some cases the protectors, and in other cases the terminal blocks, are used for the outside line terminals.

Distributing rings are conveniently placed, making it easy to run the jumper wires in a uniform, compact and neat manner. The purpose of these rings is to guide the jumper wires in the shortest path between the terminals with the minimum number of turns. Yet in spite of these conveniences jumpers are found



Wall Type Main Frame.

pulled through the wrong rings, pulled too tight through the rings, or not pulled through the rings at all.

The result is that when trouble must be cleared in a hurry, the condition of the distributing frame jumper wires seriously delays the progress of the work.

Inspection of distributing frames is usually warranted once each quarter; that is, the schedule should call for an observation of the frame every three months.

Every distributing frame should be well supplied with a sufficient number of outlets and good extension cords so that adequate light and necessary electric power can be available at all points needed. Not only are these cords used for the vacuum cleaner and electric soldering iron, but they furnish light for the proper inspection of the distributing frame and for illuminating out-of-the-way corners of the frame when working on the equipment or clearing trouble.

Inspecting Steel Framework.

The starting point in an inspection of a distributing frame is with the backbone of the frame—the steel work. Inspection of the steel angles and bars is a comparatively easy procedure, due to the open construction of the distributing frame. The steel work should be kept well painted with black asphaltum paint to avoid rust. Inspect for all bolts and screws in place, missing parts, parts out of place and broken or defective parts.

Inspect for terminal blocks securely fastened to framework with full number of mounting screws; all assembly screws tight and none missing; terminal blocks in proper alignment and not broken. The terminals should be inspected for bent or broken lugs. These lugs should be kept clean and free from dirt and excess solder. Terminal blocks and lugs should be kept free from wire cuttings, bits of insulation, loose solder, dirt or any other foreign matter even though it appears that a cross will not likely result.

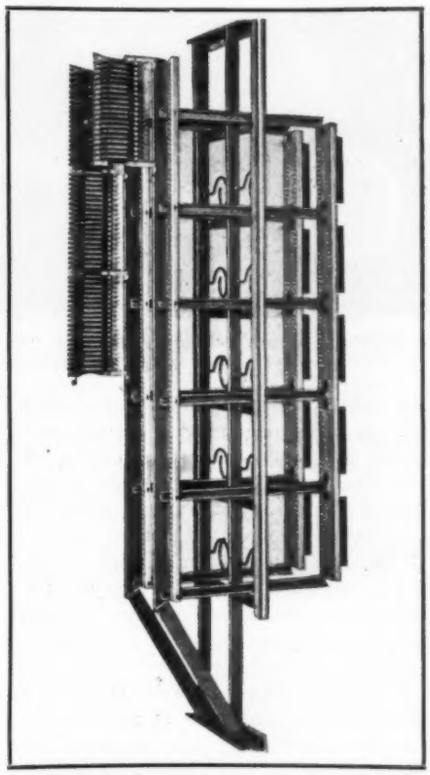
See that the distributing rings are in proper alignment and securely fastened. The condition of the insulation of the distributing rings should be observed for cracks or breaks which might injure the insulation of the jumper wires when pulled through the rings.

All distributing frames should be kept reasonably clean and free from articles except those of a permanent nature. Inspect for hazardous projections from distributing frames with a view of avoiding accidents.

Jumper Wires.

No. 20 B. & S. gage copper conductors, tinned, enameled, silk-covered, moisture-proofed, having a cotton flameproof braid and twisted in pairs or the same gage copper conductors with a high grade rubber insulation covered with flameproof braid and twisted in pairs or the same gage copper conductors with a high grade rubber insulation covered with flameproof braid and twisted in pairs, are usually used as jumper wires on main distributing frames. Do not use ordinary annunciator or bell wire as a substitute for flameproof jumper wire. To facilitate unwinding the coil of jumper wire, many companies make use of a revolving reel mounted near the top of the frame.

The jumper should be run in the shortest



Typical Floor Type Main Frame.

path between the two terminals. Do not splice jumper wire as it may cause trouble. After the jumper has been run in, see that the proper carbon blocks, heat coils or fuses are in place.

In removing the insulation from the jumper wires at the terminal lugs, care should be taken not to "nick" the copper wire. Connect the white wire to the "tip" terminal lug and the red wire to the "ring" terminal lug by wrapping the clean copper wire once around the lug through the notch. The end of the insulation of the wire should be spaced about 1/16 inch distant from the lug. Cut off the end of the wire extending beyond the lug after the connection has been soldered.

The jumper wires should not be stretched tight. In order to trace jumpers, a little slack should be provided. In the smaller frames ½-inch slack will probably be found to be sufficient. In the larger frames an inch or more of slack should be provided depending upon the length of the jumper. Avoid excessive slack. The terminal lugs should be thoroughly clean and free from excess solder before the wire is given one complete turn around the lug. Immediately after connecting the jumper wire to the terminal lugs, it should be soldered. The excuse or alibi that will justify an unsoldered connection on a distributing frame has not yet been invented.

Promptly remove all "dead" jumpers from the distributing frame. Keep all

jumpers that can be used on shorter runs. Lengths too short to use should be salvaged as junk copper.

Someone once said in discussing correct soldering methods that telephone repairmen do more of it and know less about it than any other one thing in the business. Be that as it may, soldering is one of the most frequently encountered jobs in telephone work, and if not properly performed causes endless trouble and expense.

A Dentist's Mouth Mirror is Excellent For Inspecting Soldered Joints as it Gives a Magnified View of the Connections.

Soldering is not difficult work if the essential rudiments of the process are understood and intelligently applied. Proper soldering equipment will aid the employe in making good soldered connections. The A B C's of successful soldering practice might be listed somewhat as follows:

A—The point of the soldering copper, in addition to being properly shaped, should be clean and well-tinned.

B—The wire and terminal lug should be clean and well-tinned.

C—Heat the connection sufficiently so that the solder will flux readily.

It is impossible to turn out good soldering jobs with a dirty copper point. For that reason a fireproof muslin pad should be available for wiping the copper point. The copper point should be tinned on one side only. This has a tendency to keep the solder in contact with the surface to be soldered and prevents the solder from dripping off the underside of the copper point when working on a terminal lug in the vertical position.

Only standard rosin-core wire solder should be used. It may be cut from the spools in lengths of several feet and coiled to convenient size so as to eliminate waste. Under no circumstances should an acid base soldering paste or acid flux solder be used in central office equipment soldering.

The next requirement in making a satisfactory soldered connection is to be positive that the wire and terminal lug are both cleaned and tinned. If the surface of the lug appears unsatisfactory, tin it with the soldering copper and rosin-core solder before connecting the wire. Before wrapping the wire around the lug, remove excess solder from the lug by using the soldering copper and a stiff bristle brush.

Special care must be taken in the case of tinned copper wire which is enameled in order that *all* of the enamel be removed from the wire at the point of the connection and the tinning of the wire left uninjured.

One of the fundamental rules of making good soldered connections is to hold the copper point on the lug and wire until *both* become hot enough to melt the solder. On the other hand, the connection should be soldered and the copper removed from the lug as quickly as possible so that the insulation on the terminal block will not be damaged.

Inspect a percentage of the wiring and soldering on the distributing frame for abuse of skinners, loose and unsoldered connections and rosin joints. It has been recommended that a strong light and a dental mirror will be found to be very helpful in inspecting soldered joints as it will permit a *magnified* view of the connection from every angle with little effort, and any questionable joints and outstanding defects will be detected. Take particular care to see that excess solder was not used and that connections appear to have been properly heated.

The accompanying illustration shows a ⅞-inch cone-socket magnifying dental mirror the cost of which is about one dollar. There are many other types and shapes of handles which may be secured to fit this type of mirror which makes it possible to use it in small spaces. The writer has made use of them in the adjusting of relays, locating trouble in multiple jacks and key springs and many other similar places.

Another important phase of soldering on frames that is often overlooked is that the equipment immediately underneath should be protected from dripping solder by the use of a piece of fireproof muslin or asbestos mat. Protection of apparatus from dripping solder will always be found worth while, for trouble from this source is intermittent and difficult to locate.

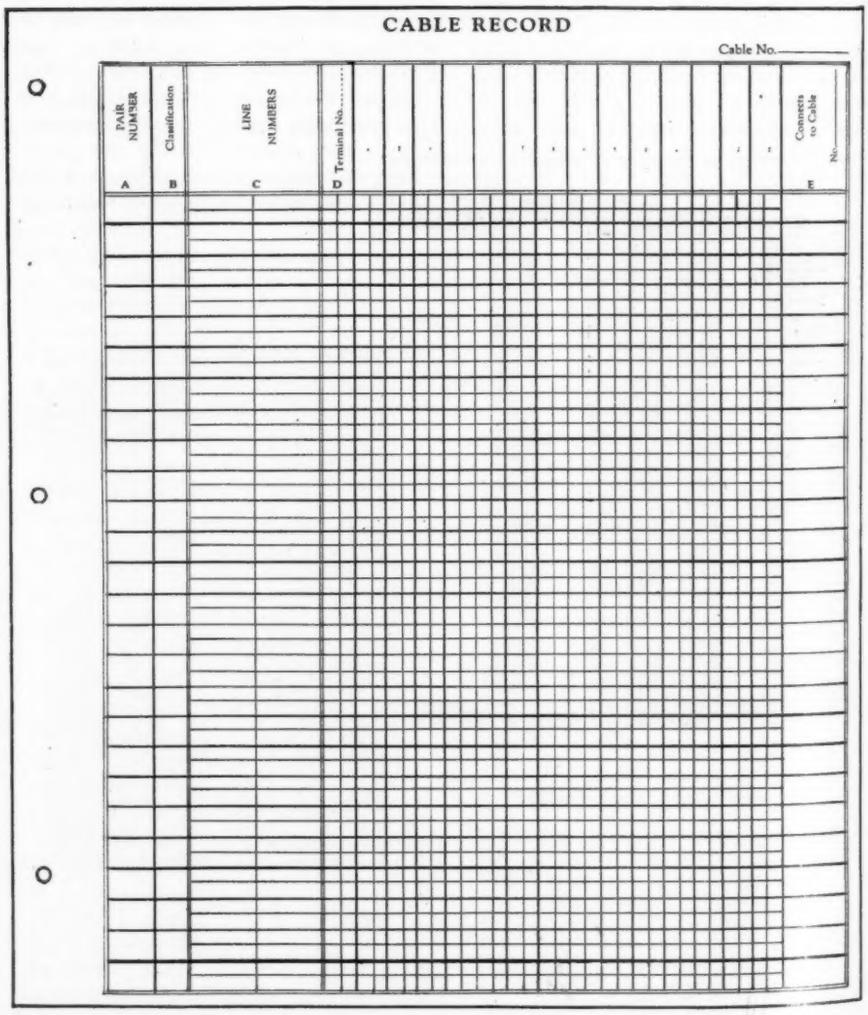


Fig. 1. Cable Record Sheet Specially Designed For Small Exchange. Size of Sheet is 9½ Ins. By 11 Ins.

Protectors should be so located that they will be accessible for inspection and maintenance, and shielded as much as possible from dust, dirt, fumes or moisture, and so that possible mechanical injury to or tampering with the protectors will be reduced to a minimum. These protective devices are necessary apparatus and should never be short-circuited by wire. Care should also be taken not to duplicate protective equipment in any one circuit as ordinarily one piece of each device is sufficient.

Care of Protectors.

The carbon block lightning arresters should be cleaned only by rubbing the carbons on a smooth piece of paper or with a bristle brush and a soft cloth, and *not* by rubbing them together or on a hard surface, such as sandpaper or emery cloth. Any carbon block that is burned should be replaced.

The carbons should be separated with only one mica spacer, if spacers are necessary. Avoid use of paper or other foreign materials as separators for carbon-block lightning arresters. Place the open side of the mica down to avoid collecting dust.

Another type of the air-gap arrester makes use of one carbon block (on the ground side) and a discharge block which does not require any mica insulation. All carbons and discharge blocks or carbons and mica separators must be properly lined up on the frame in order to function satisfactorily. In other words, the component parts of each air gap must be in line.

Examine the protector mounting to see that it is mechanically intact and free from dirt. See that the arrester springs are free from dirt and corrosion and in proper alignment so that they are capable of making secure mechanical contact with associated elements. Examine all nuts, screws and binding posts and see if they are properly tightened.

Examine the markings on the fuses and heat coils to ascertain if they are of the proper type and rated capacity. Examine the end pieces of the fuse and the fuse clips or mounting terminals, as well as the heat coil terminals and associated mounting terminals, to see that they are free from dirt and corrosion and are making secure mechanical contact.

Heat coils are sometimes a source of poor transmission and should be tested with some sort of resistance indicating instrument. Modern heat coils are wound with wire and usually have a resistance of approximately 4 ohms each. The electrical meter used for testing should have testing leads terminating in needle points.

The resistance of the heat coil and its contacts is measured by applying the test lead needle points to the proper terminal lugs of the protector unit so as to place one heat coil and its contacts between the needle points (one needle point on the jumper lug and the other on the switchboard cable lug on the same side of the line).

Inspecting Frame Ground.

In order to afford proper protection for costly central office equipment and to minimize hazards to subscribers from either lightning or crosses between portions of the outside plant and electric power wires, it is necessary to have provisions for properly grounding the equipment. For example, the function of the carbon-block arresters is to protect the apparatus against damage from high voltage by providing a shunt path from each side of the line circuit through an air gap between the carbon blocks to earth.

The operation of the arresters is dependent upon adequate ground wires, connections and grounds. For these reasons it is important that the central-office distributing-frame ground, as well as all other grounds, be maintained in good physical condition and that the resistance to earth be kept within reasonable limits.

It is regrettable that in the average exchange the central office ground, after once installed, is generally accepted as adequate and inspection and maintenance is too often neglected. Ground wires should be carefully inspected for loose joints or splices, proper insulation, freedom from sharp turns, proper supports and protection against mechanical injury where necessary in order to insure the continuity of the wire.

However, after installing any ground connection there is only one way to determine the protective value, and that is to measure its resistance.

Complete directions for testing the resistance of ground connections may be secured from the inspecting and testing section of the United States Bureau of Standards Technologic Paper No. 108, classification number C 13.8:108, entitled "Ground Connections for Electrical Systems." This bulletin of 224 pages may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C., for the price of 30 cents.

Required Cable Record.

Both the outside line terminals and the protector terminals should be plainly marked and numbered in approved manner so that any particular set of terminal lugs can be readily located. A written record, usually in a so-called "cable rec-

Instructions for Using the Cable Record.

First enter in Column A all the numbers of your cable pairs in numerical order starting with No. 1.

In Column B print in the Classification of your lines, for example, 1-B for one-party business, 2-B for two-party business, 2-R and 4-R for your party-line residences, Ru for your rural lines, or such other short designations as you may find work out best to your satisfaction.

Column C, you will note, is divided into four longitudinal spaces, these are for the telephone numbers up to four-party lines; for rural lines use only the main line number. In entering party-line numbers, use your code suffix, such as W.J.R.N. or such other as you may have adopted, after the line number. Use the upper left space for the first party, the upper right space for the second party, the lower left space for the third party and the lower right space for the fourth party.

The Several Columns following are represented as Column D. In these upright spaces in Column D at the top, write the name and/or number of the cable terminals and their locations. Draw in, in ink, under its proper cable terminal, a line representing the cable, down through the page opposite the pairs in Column A that come out in this can, skipping all numbers that do not terminate in this terminal. If you have several terminals in multiple with one another, carry them down in parallel lines to the right, skipping numbers that are not multipled.

This procedure is carried forward until all your cable pair numbers and terminals are written in.

In case you have aerial cables connecting to underground cables, use the column at the right (Col. E) to designate its connection, using another sheet to show the numbers it connects with, and in the same manner as above.

The Columns, D, are filled with small squares of about one-eighth inch. These are used to indicate the party-line position of the instruments on the lines.

The method is to make a small mark from the center of the small square outward toward the relative position of its corresponding number in Column C, the drawn line representing the cable, being in the exact center of the square. These small marks are not drawn horizontally nor perpendicularly, but at an angle to these directions. Do not confuse the aerial pair information with that of underground information. Use separate sheets.

Fig. 2. Back of Cable Record Sheet Shown in Fig. 1. Complete Directions Are Outlined For Intelligently Filling in This Printed Form.

ord book," should be kept of the outside line terminals by the cable number and cable-pair numbers, and the protector terminals by the switchboard jack numbers. Show by this record just what pair of outside line wires is connected to each switchboard jack number. Every time a jumper is removed, changed or a new jumper run in, make a new entry on this record. A correct record will be of great service in maintaining exchange efficiency.

Fig. 1 shows a simplified form, especially designed for use in the smaller exchange, for keeping a record of the wires terminating on the distributing frame. On the rear of this sheet, as shown in Fig. 2, are complete directions for systematically using this form of a cable record. These sheets, after being filled out, are bound in a standard 9½ by 11½ inch binder. Binders and sheets may be secured at reasonable prices.

The cable record book usually shows, in addition to the foregoing items, the number and location of each outside pole cable terminal as well as the wires terminating therein. These pole cable terminals are too frequently the cause of plant troubles and more care should be taken in inspecting and maintaining them. For example, these terminals should be securely mounted to the pole or fastened to the building to eliminate unnecessary vibration which often causes loose connections, broken wires, loose fuses, and similar troubles.

If the terminal is of the protected type, it should be inspected as outlined in the "Care of Protectors" section of this article. Special attention should be given to the drop wire connection in order that high resistance connections will be avoided and that the wires will not work loose. The hood or cover of the cable terminal should be in good condition and should closely fit the terminal base so as to protect the working line connections from as much dust and moisture as possible.

Value of Neatness.

Neat work is desirable in all parts of the central office, but especially on the distributing frame where, because of the open construction, the results of poor workmanship are plainly visible at all times.

Even though the frame is not in a conspicuous location there is no place for hasty or slovenly work on the frame. Clean and neat equipment, free from grime, dust, etc., gives a better appearance, resulting in better care given to the equipment by those using and working on it. Not only the frame, but the floor under and around the frame should be kept clean.

Neat work should not only be done for the sake of appearance, but because neat work is the direct result of careful work. Due to the importance of the distributing frame all work on it should receive the utmost attention from the standpoint of reliability and permanency. It is part of the duty of the central office repairman or frameman to keep the distributing frame in proper mechanical and electrical condition, and maintain it so that it will present a clean and neat appearance at all times.

JUMPER WIRE PRECAUTIONS.

1. **Do not use spliced jumper wire.**
2. **Use only approved flameproof jumper wire (do not use annunciator or bell wire).**
3. **Jumpers should never be "stretched" tight.**
4. **Leave one to three inches slack in jumper.**
5. **Avoid excessive slack in jumpers.**
6. **Do not "kink" jumper wire when handling.**
7. **Clean terminal lug of excess solder.**
8. **Do not "nick" wire when removing insulation.**
9. **Untwist jumper several inches through fanning strip.**
10. **Do not run jumpers through holes with cable wires.**
11. **Connect white wire to "Tip" terminal lug.**
12. **Connect red wire to "Ring" terminal lug.**
13. **Leave wire insulation 1/6 inch distant from lug.**
14. **Make only one turn around lug with wire.**
15. **Use only standard rosin-core wire solder.**
16. **Use only a clean, well-tinned soldering copper.**
17. **Solder wire immediately after connecting.**
18. **Avoid rosin joints and excessive amounts of solder.**
19. **Remove promptly all "dead" jumper wires.**
20. **Salvage all unusable jumper wire as junk copper.**

Indiana Bell Company to Erect New Headquarters Building.

A $1,500,000 building program that will involve removal of the Indiana Bell Telephone Co.'s building in Indianapolis, an eight-story structure, to another site, and construction of a new building, has been announced. J. F. Carroll, president of the company, made the announcement following a recent meeting of the directors.

In addition to removing the present building to a site immediately west of its present location, every department in the building, including the telephone exchange, will continue to operate uninterrupted by the removal. The new building will cover a greater site than the present structure.

The Marion Club building, south of the present telephone building, and the old automatic telephone building yet south of the Marion Club, will be razed to add to the site of the proposed structure, giving the new building a frontage of 200 feet on Meridian street and a depth of 100 feet along New York street. Both buildings to be razed have been owned by the Indiana Bell company for some time and have been used to house some of its departments.

Although razing of the two buildings will begin shortly, plans for the new building are still in embryonic form. The announcement stated, however, that it will equal the height of the present building and will be of Indiana limestone. Its architecture will harmonize with that of the Chamber of Commerce building to the north and other structures surrounding the Indiana World War Memorial Plaza.

The building will house general offices of the company, exchanges and other departments, and the present building will be used for auxiliary space.

Slack cables will be used in removing the present building to its new site to connect the telephone exchanges in the building with the city and to provide electric current necessary in the operation of the exchanges, for lighting and for operation of elevators. Sewage and water connections will be extended as the building is moved.

The removal project will be completed by December 1, the announcement said, and the new building will be finished in 1932.

Bell's Quarter-Million Booths Used Billion Times Yearly.

There are in service in the Bell system a quarter of a million telephone booths, and it is estimated that these booths were used a billion or more times during the past year. The great increase both in the use and in the number of telephone booths gives them a conspicuous and important status in public interiors. The result is that the standard type of booth is considered quite satisfactory in utility, comfort, convenience, and appearance.

The evolution of the present telephone booth, however, formed an interesting chapter in telephone development. Since the first public telephone booth made its appearance, it has undergone many modifications and improvements to augment its safety, durability and attractiveness for the comfort of users. Many of these improvements are more or less obvious, but some of them are not at once apparent, although quite important.

Two different styles of telephone booths are now being used, one to accommodate the patron standing, and the other equipped with a seat. In the former type, the coin collector and shelf are mounted conveniently higher than in the latter. Both are furnished with exterior finishes of dark mahogany, medium mahogany, oak and walnut.

Drivers of Motor Cars Should Be Careful

In 1929, 31,000 People Killed by Automobiles in United States; 6,000 Were Children Under 15 Years—Death Rate from Accidents Higher in United States Than Foreign Countries—Company Employes Should Be Taught Safety Code

By M. T. Caster,

General Plant Superintendent, Lincoln Telephone & Telegraph Co., Lincoln, Neb.

Last year, according to the records of the Nebraska Safety Council, 31,000 people were killed by automobiles in the United States. Roughly, this is at the rate of one killing every 15 minutes, night and day, Sundays and holidays; and 6,000 of the victims were children under 15 years of age.

In 1928 there were 27,966 deaths from motor vehicle accidents; thus 1929 showed an increase of 3,034 or 8.5 per cent. By the end of 1930, the death rate will be still higher, unless each driver uses more care, because there are today more cars and more pedestrians, and nobody has found a real solution for the traffic problem which is swamping town and city.

The most outstanding characteristic of the 1929 experience is the great increase in motor vehicle deaths, above all other types of accidents. The increase in total fatalities in 1929 was only 2,000, so it is evident that fatalities, not involving motor vehicles, decreased by about 1,000. Nevertheless any reductions in other types of accidents are overcome each year by the mounting number of deaths due to motor vehicles.

In the state of Nebraska alone, there are 348,660 automobiles operating on the highways and on town and city streets. Most of these are privately-owned cars, such as many of you are driving. Out of the 1,398 employes of the Lincoln Telephone & Telegraph Co., it is probable that not less than 900 drive private cars. The company with all its business operates approximately 185 cars, or about one-fifth as many as are driven privately by its employes. The same relationship holds true between the total number of privately-owned cars, and those operated for commercial purposes only.

It is plain to be seen, then, that the burden of the risks in motor-vehicle accidents today lies with the owner of the private vehicle and his family. It is a fact that trucks, buses, etc. are responsible for less deaths per vehicle than private cars. It is to be regretted that private cars, with less demands for speed, are frequently driven with less care than commercial vehicles.

As to commercially-owned cars, our company, as well as other larger concerns, is making every effort today to control accidents. Drivers of the telephone company's cars are instructed in safety matters, given a safety code to better control their habits in driving motor vehicles. They are coached and checked on their knowledge and observance of state motor vehicle laws and local traffic ordinances.

Company drivers are taught one safety code that might be well adopted by every employe on the company's payroll, and that is: "In case of doubt, remember that the other car always has the right of way." And then again remember: "Always drive as carefully as if every child in the street were your own!"

Remarkable success has resulted from these efforts of employes to eliminate traffic hazards, in the operation of company cars under all the conditions! Think what the effect would be if all the personal cars of telephone families were equally pledged to safety for themselves and consideration for the safety of others. During the 1930 tourist season in Nebraska, will not each one of you accept the responsibility and personally undertake to reduce the number of accidents in your state?

"Think What the Effect would be," says Mr. Caster, "if all the Personal Cars of Telephone Families Were Equally Pledged to Safety for Themselves and Consideration for the Safety of Others."

Looking into the records of the National Safety Council, as submitted to the Nebraska council, the fact is shown that, while the death rate from accidents remains higher in the United States than in any important foreign country, it is interesting to see that in some countries the rate is advancing faster than here.

In 1929 in Wales and England, the death rate from motor vehicle accidents increased 2.9 deaths per 100,000 population, over the 1928 figures. In New Zealand, the increase was 5.8. In the United States during the same period, the death rate increased from 78.4 to 79.2, only 0.8 deaths per 100,000.

However, motor-vehicle accidents continue to be the dark blot on American accident experience. Motor vehicles killed twice as many people in 1929 as in 1922!

The economic costs of motor vehicle accidents continue to rise along with the number of deaths and injuries. These costs are now approximately $350,000,000 greater annually than in 1923. The estimate for 1929 is $850,000,000.

More than one-half of the motor-vehicle fatalities reported resulted from collisions between automobiles and pedestrians, about one-fifth from collisions of one automobile with another, and one-tenth from non-collision operating accidents. These reports, however, came from territory predominately urban; in the entire country, pedestrian deaths are estimated as about 50 per cent of the total, from the records of the Nebraska Safety Council.

Accurate nation-wide figures are available on accidents at railroad grade crossings. The number of persons killed in such accidents decreased from 2,586 in 1928 to 2,485 in 1929, a decline of 3 per cent. On the other hand, the number of persons injured increased from 6,666 to 6,894, or 2 per cent.

Carbon monoxide deaths in 1928 showed an increase of 2 per cent over 1927, in contrast with a 6.7 per cent increase in primary automobile deaths. This indicates that the motoring public realizes somewhat better the great hazard of running an automobile engine inside a closed garage.

Going back to crossing accidents, the 2,485 run over at crossings were presumably mostly attributable to drivers' carelessness; but there were also 28,615 cases between crossings, where the pedestrian had nobody to blame but himself.

Unfortunately many of these latter were children. While there is little excuse for the adult who suddenly steps into the street between crossings, the child, in many localities, has no other place to play. Records show that the most children are killed in June, but May, July, and August are also danger months. Saturday is the big day of the week for all kinds of motor accidents, with Sunday a close second. On the whole, the peak of automobile killings is in the fall, the end of vacation periods.

In spite of the continued publicity given accidents by the Nebraska Press Association and the Nebraska Safety Council, with the cooperation of the newspapers, there has been an alarming increase in both accidents and deaths. Most of these have resulted from motor accidents, and in many cases careful driving and obedience of traffic laws and courtesy in driving might have avoided them.

In spite of these pleadings, laws and rules, publicity and the continued admonition of Nebraska newspapers for safe and sane driving, speed and chance-taking continue to be the ruling motives of many automobile drivers.

The frequently-printed slogans, "Lose A Minute and Save A Life," in so many cases fall on deaf ears. There seems to be a spirit of haste and speed that regards not the lives of innocent ones, and in so many cases it is innocent and careful drivers who suffer. Until this spirit of recklessness in driving is curbed, there will continue in every newspaper big headlines telling of the death, injury, and disabling of men, women, and children. All in all, it is one of the greatest and most puzzling problems of the day.

Won't you, as company employes, remember the safety driver's creed during these closing vacation days and save a life:

"In case of doubt, remember that the other car always has the right of way."

"Always drive as carefully as if every child in the street were your own!"

Good Programs at District Meeting

Discussion of Copper-Alloy Line Wire and the Securing of New Business Features Men's Conference—Noon Luncheon and Entertainment Enjoyed by 150; 88 Delegates in Separate Traffic Conference; 47 Illinois Towns Represented

The Illinois Telephone Association's fifth district meeting this year attracted 150 delegates to Litchfield, on Wednesday, July 16. The traffic conference was conducted in the Masonic Temple. The attendance of the traffic school was 88 delegates.

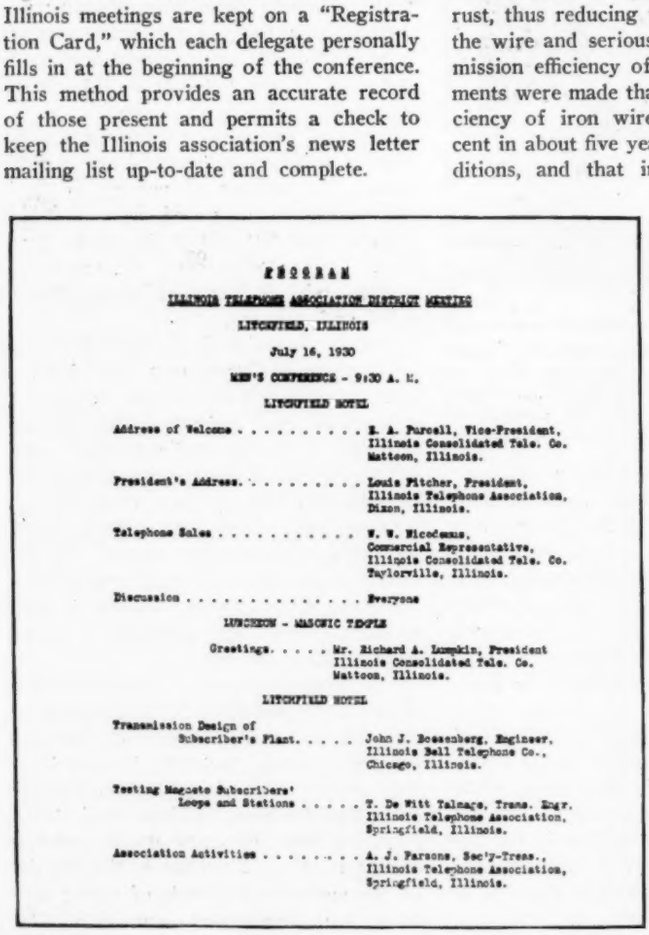
The plant and commercial men's meeting was held in the Chamber of Commerce room of the Litchfield Hotel. The total attendance of the Litchfield district meeting was 150. Attendance records of all Illinois meetings are kept on a "Registration Card," which each delegate personally fills in at the beginning of the conference. This method provides an accurate record of those present and permits a check to keep the Illinois association's news letter mailing list up-to-date and complete.

Each delegate was furnished with a mimeographed outline or program of the activities of the day. The programs presented at the Litchfield meeting were planned well in advance of the conferences and were carried out in full.

Louis Pitcher, president of the Illinois association, in his opening remarks discussed the advisability of using a copper-alloy line wire for local and rural open-wire circuits to eliminate the inherent characteristic of galvanized iron wire to rust, thus reducing the tensile strength of the wire and seriously affecting the transmission efficiency of the iron wire. Statements were made that the transmission efficiency of iron wire was reduced 50 per cent in about five years under average conditions, and that in about eight to ten years it was further reduced to but one-third of its original transmission efficiency.

A lengthy discussion of the characteristics of copper-cadmium alloy brought out the fact that such an alloy having the same tensile strength and transmission efficiency of No. 12 BWG iron wire with a comparable first cost (taking into consideration the high salvage value of the copper-alloy) would furnish circuits having a service life many times that of iron wire. This subject excited much comment and it gives promise of proving—in a suitable substitute for iron subscribers' circuits, even in the smallest of exchanges.

Wm. W. Nicodemus, chief clerk of the Illinois Consolidated Telephone Co. at Taylorville, gave some excellent pointers on the securing of new business. He dis-



PROGRAM

ILLINOIS TELEPHONE ASSOCIATION DISTRICT MEETING

LITCHFIELD, ILLINOIS

July 16, 1930

MEN'S CONFERENCE - 9:30 A. M.

LITCHFIELD HOTEL

Address of Welcome . . . . . E. A. Purcell, Vice-President, Illinois Consolidated Tele. Co. Mattoon, Illinois.

President's Address. . . . . Louis Pitcher, President, Illinois Telephone Association, Dixon, Illinois.

Telephone Sales . . . . . W. W. Nicodemus, Commercial Representative, Illinois Consolidated Tele. Co. Taylorville, Illinois.

Discussion . . . . . Everyone

LUNCHEON - MASONIC TEMPLE

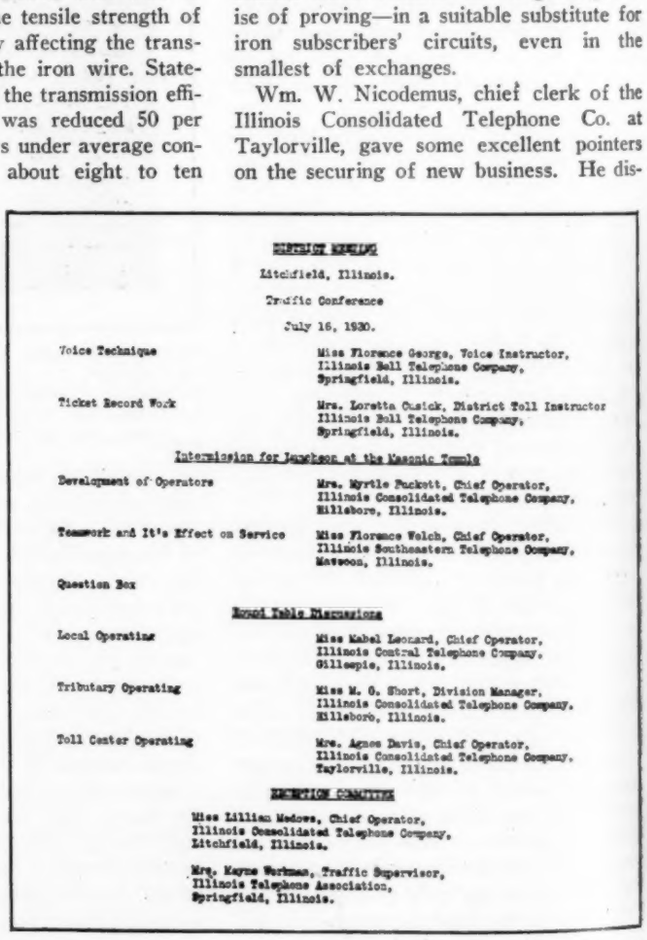
Greetings. . . . . Mr. Richard A. Lumpkin, President Illinois Consolidated Tele. Co. Mattoon, Illinois.

LITCHFIELD HOTEL

Transmission Design of Subscriber's Plant. . . . . John J. Boesenberg, Engineer, Illinois Bell Telephone Co., Chicago, Illinois.

Testing Magneto Subscribers' Loops and Stations . . . . . T. De Witt Talmage, Trans. Engr. Illinois Telephone Association, Springfield, Illinois.

Association Activities . . . . . A. J. Parsons, Sec'y-Treas., Illinois Telephone Association, Springfield, Illinois.



DISTRICT MEETING

Litchfield, Illinois.

Traffic Conference

July 16, 1930.

Voice Technique — Miss Florence George, Voice Instructor, Illinois Bell Telephone Company, Springfield, Illinois.

Ticket Record Work — Mrs. Loretta Cusick, District Toll Instructor Illinois Bell Telephone Company, Springfield, Illinois.

Intermission for Luncheon at the Masonic Temple

Development of Operators — Mrs. Myrtle Puckett, Chief Operator, Illinois Consolidated Telephone Company, Hillsboro, Illinois.

Teamwork and It's Effect on Service — Miss Florence Welch, Chief Operator, Illinois Southeastern Telephone Company, Mattoon, Illinois.

Question Box

Round Table Discussions

Local Operating — Miss Mabel Leonard, Chief Operator, Illinois Central Telephone Company, Gillespie, Illinois.

Tributary Operating — Miss M. G. Short, Division Manager, Illinois Consolidated Telephone Company, Hillsboro, Illinois.

Toll Center Operating — Mrs. Agnes Davis, Chief Operator, Illinois Consolidated Telephone Company, Taylorville, Illinois.

ELECTION COMMITTEE

Miss Lillian Medows, Chief Operator, Illinois Consolidated Telephone Company, Litchfield, Illinois.

Mrs. Wayne Workman, Traffic Supervisor, Illinois Telephone Association, Springfield, Illinois.

Programs Showing Activities of Day at Litchfield District Meeting of Illinois Telephone Association. Illustrations Show Style Used in the Mimeographed Program.

cussed telephone sales compaigns held in various states as well as the unusually successful campaign carried on by the Illinois Bell Telephone Co. in central Illinois. In part Mr. Nicodemus said:

"The men who direct the destinies of the telephone business have always selected workers with great care and have interested themselves in the development and growth of their employes. There is no place for the mediocre worker in this business, and such workers are automatically weeded out as the demands exceed their abilities.

For this reason the average intelligence of telephone workers rates high in comparison with that of the personnel of other industries, and it was only natural that this latent talent would be employed in the task of solving the problem of service development which had become an obstacle of serious proportions in the path of progress.

Many plans and methods were tried out during the experimental period preceding the conclusion arrived at by executives that every company had been maintaining within itself an unsuspected source of selling ability; and it is worthy of note that of all the results obtained by varying methods, the outstanding successes were registered in those instances where the job of securing new business was put squarely in the hands of employes."

Mr. Nicodemus referred to a number of articles that have been published in TELEPHONY, and made quotations from them.

He continued his talk saying that "In any organization, large or small, there lies dormant a latent sales ability which awaits only the opportunity that will lose it to accomplishment; and this ability could be encouraged to the lasting benefit of any company that elected to furnish that opportunity.

"Every company should try out at least one campaign of this sort. Even if no sales whatever were made, they would derive from such an effort a tremendous amount of good advertising and good-will engendered by the personal contact of employe and customer, and a better understanding of company aims and ideals on the part of subscribers.

I venture the prediction here that from now on, every telephone company will have to keep up a continuous, aggressive fight for new business and the retention of those subscribers now on the directory lists.

We must consider as a competitor every organization that operates a monthly payment plan of merchandising, no matter what the commodity merchandised, for the reason that every sale made under this plan lops off another portion of the family income to the certain detriment of acquiring new business and making collection for that already existing."

To illustrate his point, Mr. Nicodemus referred to the Montgomery Ward store in Taylorville, Ill., whose entire window space was taken with cards which announced its new policy of deferred payments on purchases of $25 or over.

Continuing, he said: "We must work

(*Turn to page* 34, *please.*)

District Meeting

REGISTRATION CARD

THE ILLINOIS TELEPHONE ASSOCIATION

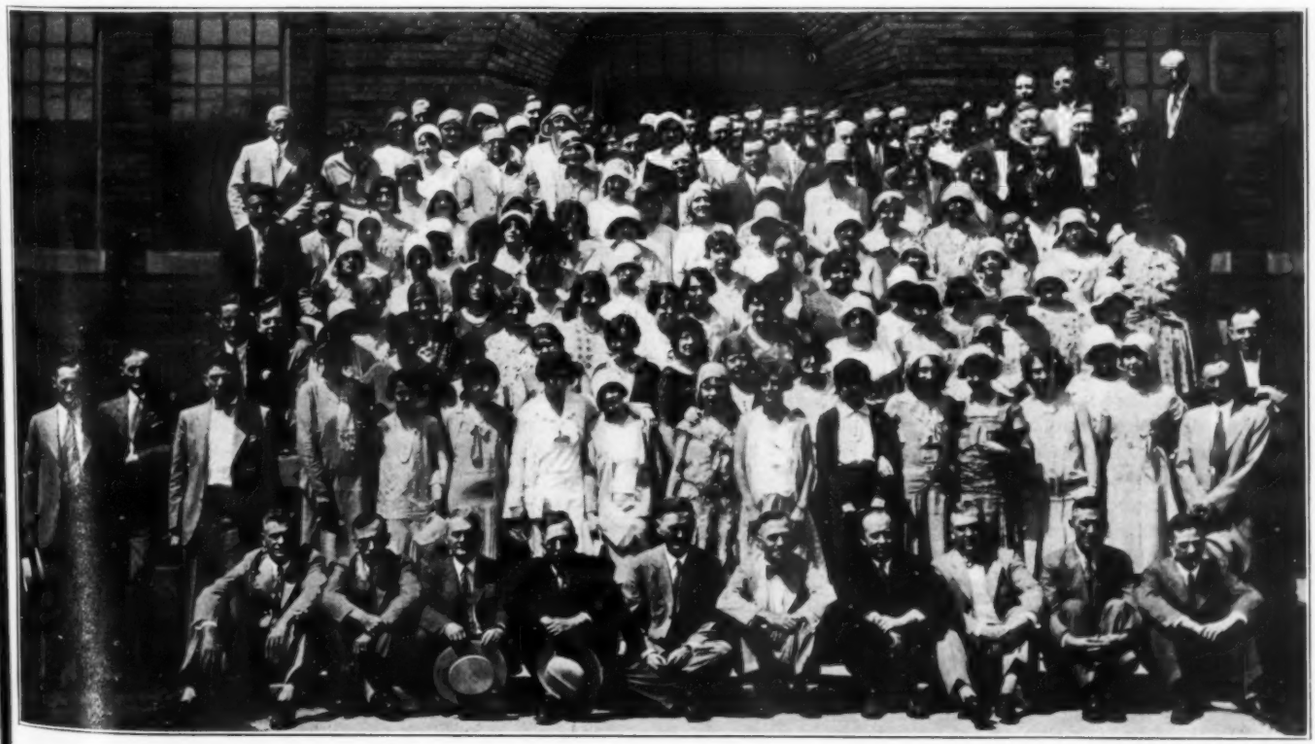
Your Name .....

Town .....

Your Company .....

Your Position with Company .....

Simplified Form of Registration Card Used in All Illinois Association District Meetings to Secure Accurate Records.



The Fifth District Meeting of Illinois Telephone Association This Year, Held at Litchfield, Attracted an Attendance of 150 from 47 Towns.

Here and There in Telephone Work

The Relation of the Decibel to Circuit Transmission Efficiency.

By Harry N. Faris,
Techincal Engineer, United Telephone Co., Abilene, Kansas.

Although the decibel is merely the former standard transmission unit or "T U" given a definite name, it is not the exact equivalent of the "Standard Cable Mile Loss" of 1912, which unit was entirely abandoned on the adoption of the "T U" system. The published explanations of the T U system were so highly mathematical that many continued to think in terms of the "cable mile," even after measuring equipment had been recalibrated to the newer unit.

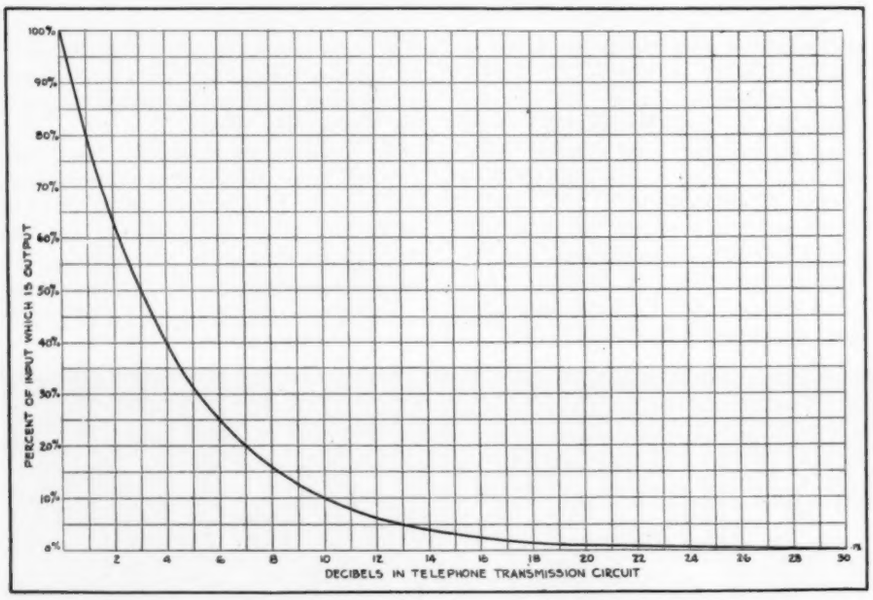
The adoption of the term "decibel" was not attended by any extensive explanations of the unit with which it was assumed we were already familiar. Those of us who are not well grounded in our understanding as to what the unit of transmission really is, will find a very clear and most interesting explanation by Dr. J. O. Perrine of the American Telephone & Telegraph Co. in Telephony of March 22, 1930, which plant forces and traffic supervisors will find it profitable to study.

To give the percentage equivalents of the higher losses, the accompanying curve covering the entire range from 1 to 30 decibels, has been prepared without reference to the gains from amplifying "repeater" equipment, without which long distance telephony would be impossible. We believe the nature of the decibel unit has been as well explained by Dr. Perrine as it can be without going deeply into mathematics, and the graph is merely an extension or completion of the table in his article up to 30 db.

The graph also helps us to see that although the first db. of circuit loss reduces the input energy from 100 per cent to 79.4 per cent, the second db. merely reduces the new 79.4 per cent input to 79.4 per cent of that figure, or 63.1 per cent of the original 100 per cent input. In like manner at the end of the third db. of circuit loss the original input energy has been reduced to 50 per cent, exactly one-half. Also at the end of the 20th db. we have left but 1 per cent of our original input energy, and at the end of a 30 db. circuit, we have only 1 per cent, *or a one-thousandth part* of our original input energy.

From the table and graph it might appear that at 20 db. the transmission loss has almost "hit bottom" and that there is but little further decrease in volume at the end of a 30 db. circuit, but closer scrutiny will show that although both volumes are low, the volume at the end of a 20 db. circuit is 10 *times as great* as at the end of a 30 db. circuit, just as a 10 db. circuit, with 10 per cent of the original energy, is ten times as great as a 20 db. circuit with only 1 per cent of the original energy.

Likewise a zero db. circuit, with 100 per cent of its energy, is ten times as great as the 10 db. circuit with only 10 per cent of the original energy. This last condition reminds us that the natural unit is the "Bel," which for convenience we have divided by 10 into "deci-bels," just as small units of length and volume are expressed in centimeters and cubic centimeters instead of "hundredths of meters" or "millionths of cubic meters."



Comparison of Decibels With Percentages of Transmission Efficiency.

Thus, 10, 20 and 30 decibels really represent 1, 2 and 3 "bels," the later unit being such transmission loss as will reduce input energy by one order of magnitude, making the output energy one-tenth of the input energy. In like manner the decibel is such loss as recurring successively ten times will amount to one bel, or a reduction to one-tenth of original input.

The foregoing should enable any of us to get away from the erroneous idea that the percentage curve is a straight line instead of the logarithmic curve which the graph shows.

The straight line loss idea became imbedded with many back in the days of the "cable mile" unit. At that time the great labor of percentage figuring and the observation that 32 miles of No. 19 gauge "standard cable" was the practical commercial limit of unamplified transmission lead to the adoption of the "standard cable mile loss" as the unit for transmission calculations.

These cable mile units could be added, just as we now add decibels, to arrive at total cumulative loss, but most laymen and many practical telephone men jumped at the wrongful conclusion that a 16 cable mile circuit should have half the volume of an 8 cable mile circuit, whereas it really has only about one-sixth, or an error of nearly 300 per cent.

Particularly in the case of equipment, it is necessary to remember that a small loss, such as that of a ½ db. repeating coil in a line circuit, means an initial reduction in volume of nearly 11 per cent, and that an inefficient type of repeating coil with a 2 db. loss would reduce volume by 37 per cent before leaving the initial office.

To keep these relations constantly before us, it is really not necessary to have a conversion table or a large graph constantly at hand. Any one who has occasion to make transmission calculations, is likely to have, or have access to, a slide rule; and it is only necessary to divide the upper margin on the rule into 20 equal spaces with division points numbered 0 to 20 from right to left. The 0 to 20 figures then represent decibels and the corresponding percentages of efficiency, from 100 per cent down to 1 per cent may be read directly on the upper half of the rule or on the upper half of the centered slide.

For circuits higher than 20 decibels, the same db. scale figures can be used with the first 20 db. added and we again read the percentage directly. Thus, for 30 db. we add to 20 the additional 10 and read the percentage as 10 per cent reduced by two orders of magnitude, or .1 per cent.

In the hope of assisting Dr. Perrine's

article in getting over completely the idea of the adopted transmission unit and the relation between decibels and percentage of efficiency, these notes and the accompanying graph are respectfully offered.

Nebraska Company Prepares for Inaugurating New Sales Plan.

The Lincoln Telephone & Telegraph Co. has just concluded a series of five conferences attended by exchange managers, chief operators, cashiers and commercial representatives, preparatory to launching a new sales plan. The first was held at York, and the others at Hastings, Lincoln, Beatrice and Nebraska City. The district manager presided at each conference, and addresses made by H. F. McCulla, assistant commercial superintendent, who outlined the plan and its purpose, by Kenneth Lawson, sales engineer, who gave the details, and by C. W. Motter, director of publicity, who presented the features of the accompanying advertising.

Mr. McCulla said that the modern conception of business and business growth makes it necessary for the public utilities, like all other business, to go after sales and not wait for persons to come to them. Certain quotas have been established for every exchange, and these are to be used as goals to be reached at the end of the year.

This makes it possible for the exchange manager to schedule his activities so that he will know if his exchange is making sufficient progress each month. Employes are being urged to make sales activity a vital part of their daily work, for, in so many contacts with the public, opportunity often arises to talk with patrons over some phase of service.

Surveys made by the commercial department have shown the particular markets that can be cultivated with profit. For instance, private branch exchange subscribers are the company's largest customers, with requirements for service that are exacting. Yet, as a rule, companies leave largely to the control of the customer the amount of switching equipment, number of trunks and location of stations. He is left to judge of the adequacy of the service although he is in some other business than the telephone business, while the person serving him is engaged in the latter.

There is a wide market for miscellaneous services in connection with private branch exchanges, since executives and employes often require more than one line to handle their personal service expeditiously.

In the group of main station business subscribers it has been found that there are many professional and business men who are good prospects for extension service and miscellaneous equipment. It is recommended that this field be covered once a year by canvassing a 12th of the total business subscribers each month.

There is a large undeveloped market in the better and medium class homes for the sale of similar service. Residence extension development is low in many exchanges; and it is regarded as worth pointing out that the greatest progress during the last two years in the sale of additional extensions, has been made at exchanges with a high extension development. In addition to general employe activity, conditions such as excess idle plant in some exchanges or sections of exchanges may warrant sales by special sales forces.

The increased use of toll facilities is due to swifter service and advertising methods of various types that have impressed individual subscribers with new and valuable uses to which they may be put. From a sales viewpoint the toll market is divided into four groups—the business subscriber, the residence subscriber, the transient and the connecting company.

In dealing with the former market, the fact is stressed that the best results may be expected from capable salesmen working on the subscribers' premises, with a pre-study of the communications used by business organizations that have state-wide activities. The latter type are good customers for special contract service such as full-period talking circuits, short-period talking circuits and telephone typewriter service.

In developing residence toll business it is important to mix educational work to familiarize subscribers with the speed, high quality and low cost for the type of messages originating in homes.

The transient market is made up of hotels, hospitals, conventions and tourists; and special instructions are being given as to how this can be developed by cooperation with managers of the institutions.

In the general sales plan, the commercial department undertakes the responsibility for active leadership. So it has been thought unwise to rely so completely upon the splendid results from previous employe sales plans. Instead, the commercial department, with its well-trained and adequate sales organization, is to furnish that leadership deemed vital if employe sales are to be continuously successful.

So the first line in this battle for new business will be the employes, who will turn in sales prospects observed or learned of by them; and the second line, commercial department employes who will be held responsible for effective results.

SAFETY DOCTRINES.

Unsafe to Safe.

By JOHN A. BRACKEN.

Accidents on the job slow up the progress of the work, entail inconvenience, regret, shock or suffering, and financial loss.

Proper methods adopted by the foreman or other supervisors can be used to change the unsafe into a safe worker by consistently calling his attention to any unsafe practices he may follow.

Once conscious of his failings, the proper worker will try to correct his short-comings relative to faulty practices.

Fort Wayne, Ind., Company Installs Speed Governors on Cars.

In an effort to promote safety, speed governors have been installed on all motor cars and trucks of the Home Telephone & Telegraph Co., Fort Wayne, Ind.

The governors installed on cars used in the city have been regulated to permit a maximum speed of 30 miles an hour. Cars in use outside the city will be unable to attain a speed of more than 40 miles an hour. The company operates 60 automobiles in installing and maintaining telephone service in and around Fort Wayne.

This safety precaution is in line with the company's policy to eliminate generally all hazards and dangers that cause injuries and in its automobile service to avert all possible traffic accidents. Recently the drivers of all Home company cars were given an eye test to determine the fitness of each individual to operate a car.

The company maintains a safety committee which meets monthly to discuss all problems relative to the safety of the employes at their work. Frank X. Staub is chairman of this committee.

Detroit's First Telephone Shows Transmission Improvements.

The first telephone ever installed in the city of Detroit, Mich., has been on the retired list for many years, but it returned to active service temporarily in March when David M. Gray, vice-president and secretary of Frederick Stearns & Co., spoke over the ancient instrument with Frederick Sweet Stearns, chairman of the board of the Stearns concern, who was at Miami Beach, Fla.

It was in the Frederick Stearns drug store that this telephone, the first in Detroit, was installed in 1877. It was one of the very first commercial instruments in history, and now reposes in the Bell Telephone Laboratories museum in New York City. It is a magnetic type of instrument in which the same aperture serves both for listening and speaking.

When this instrument was built, the longest distance that had been spanned by the human voice was only a few miles, but in 1930 ,the same instrument was able to talk approximately 1,155 miles from Michigan to Florida. The clearness with which this conversation was carried on served anew to point to the fact that the great improvements in telephony in the past 50 years have been largely improvements involving problems of transmission.

The Financial Side of Companies

Miscellaneous Items of Interest Regarding Financial Matters of Telephone Companies—New Securities Issued During Past Month—Figures From the Monthly Reports of Larger Companies to Interstate Commerce Commission

Statistical 1929 Operating Data of Class A Independent Companies.

At the recent conference of class A member companies of the United States Independent Telephone Association, statistical data on their 1929 operations were submitted by President F. B. MacKinnon. The accompanying table gives a general comparative summary for 1920 to 1929, inclusive, of 66 of the 77 class A member companies of the association.

The figures were taken from the reports of the companies to the Interstate Commerce Commission, or in the case of recently consolidated companies, from the reports to the various state commissions of the D class companies involved in these consolidations. In some cases it was impossible to secure data for parts of the year in which the consolidation took place. In such cases, estimates for these periods were made, based upon the prior years' operation.

For those companies included in the summary that have during the year acquired additional exchanges by purchase, it has been necessary to build up back records so that the figures for 1920 cover the same properties that are covered by the figures for 1929.

This is true also of the 1928 figures, which may not always coincide with the figures of the companies themselves because included in the 1928 figures submitted in the table are the operating data for property acquired during 1929. These are treated by the association as if they were owned by the operating companies in 1928 and their figures are included in the companies' data for that year.

American T. & T. Six Months' Revenues Show Gain.

The mid-year report of the American Telephone & Telegraph Co. shows both second quarter and half-year earnings larger than in 1929.

Net income for the first half of this year was $81,671,847, equal to $5.71 a share on 14,303,300 average common shares outstanding, compared with $80,102,038, or $6.15 a share on 13,028,807 shares, for the first half of 1929. While there was a gain of $1,569,809 in net income, there was a 44-cent decline in earnings a share, due to an increase of 1,280,228 in the number of shares outstanding, largely through the conversion of bonds into stock this year.

All classes of revenue showed gains over the first half of 1929 despite the business depression. Telephone operating revenues were $58,149,441, against $54,696,001; revenue from dividends was $72,254,344, against $66,341,283, and revenue from interest was $13,399,133, against $9,056,079. Expenses were also higher, as well as the company's charges, so that gains of $13,829,117 in gross revenue and of $6,554,510 in net earnings resulted in an increase of only $1,569,809 in net income, while surplus after dividends was $5,836,162 lower than in the first half of 1929.

Walter S. Gifford, president, in his letter to stockholders accompanying the report, says that "the volume of general industrial activity during the first six months of 1930 has continued distinctly below the record levels of 1929, although comparisons with performance in 1928 have not generally made an unfavorable showing.

"The number of telephones added to the Bell system during the half-year just ended was about 165,000. The number of long distance messages has continued greater than a year ago, the gain during the second quarter of 1930 being slightly larger than that in the first quarter.

The expenditures so far this year for additional plant facilities to provide service of the highest quality and to meet the continuing and prospective growth in the use of wire communication have exceed-

	1920.	1927.	1928.	1929.	1920–1929 Increase.	1928–1929 Increase.
No. of central offices	1,210	1,358	1,418	1,446	236	28
No. of company-owned stations	766,934	1,160,929	1,216,768	1,254,052	487,118	37,284
No. of service stations	.....	53,406	54,247	53,267	.....	*1,040
Toll wire mileage	.....	181,458	189,170	201,133	.....	11,963
Fixed capital	101,433,458	187,610,875	201,862,324	215,498,974	114,065,516	13,636,650
Total assets	116,363,403	212,662,433	233,963,952	249,356,344	132,992,941	15,392,392
Capital stock	52,469,280	91,432,562	96,737,925	104,024,640	51,555,360	7,286,715
Funded debt	33.694,921	68,457,319	73,619,250	74,189,250	40,494,329	570,000
Operating revenue	$22,305,986	$45,980,958	$48,880,661	$51,521,246	$29,215,260	$ 2,640,585
Depreciation	3,361,292	7,925,766	8,185,729	8,420,727	5,059,435	234,998
Current maintenance	4,047,959	7,351,269	7,585,173	7,931,975	3,884,016	346,802
Traffic	5,145,078	8,195,830	8,331,361	8,516,518	3,371,440	185,157
Commercial	1,632,671	3,502,978	3,633,611	3,877,854	2,245,183	244,243
General and miscellaneous	2,001,099	3,242,591	3,485,375	3,343,578	1,342,479	*141,797
Total operating expenses	$16,188,099	$30,218,434	$31,221,249	$32,090,652	$15,902,553	$ 869,403
Net operating revenue	6,117,887	15,762,524	17,659,412	19,430,594	13,312,707	1,771,182
All other revenue	65,529	519,291	665,920	954.575	889,046	288,655
Taxes	1,347,667	3,498,173	3,749,203	3,895,923	2,548,256	146,720
Other deductions	801,635	1,561,971	1,586,201	1,717,289	915,654	131,088
Total deductions	2,149,302	5,060,144	5,335,404	5,613,212	3,463,910	277,808
Income available for Int. and Divs.	$ 4,034,114	$11,221,671	$12,989,928	$14,771,957	$10,737,843	$ 1,782,029
Interest on funded debt	1,985,944	3,396,892	3,923,628	4,098,247	2.112,303	174,619
Available for dividends	2,048,170	7,824,779	9,066,300	10,673,710	8,625.540	1,607,410
Percentages:						
Operating revenue to fixed capital	22.0	24.5	24.2	23.9	Gain in Telephones	
Inc. available for Int. and Div. to fixed cap.	4.0	6.0	6.4	6.9		
Available for div. to cap. stock	3.9	8.6	9.4	10.3	1920–1929	63.5
Interest to funded debt	5.9	5.0	5.3	5.5	1927–1928	4.8
Depreciation rate	3.3	4.2	4.1	3.9	1928–1929	3.1
Op. ratio—All expense to operating revenue.	82.2	76.7	74.8	73.2		

*This ratio includes taxes, rents and other deductions as operating expense.

General Comparative Summary For 1920–1929, Inclusive, of 66 Class A Independent Telephone Companies Compiled By United States Independent Telephone Association.

ed those for the same period of 1929."

The earnings reports for the first halves of 1930 and 1929 compare as follows:

	6 Months Ending June 30, 1929.	*June 30, 1930.
Earnings:		
Dividends	$ 66,341,283	$ 72,254,344
Interest	9,056,079	13,399,133
Tele. operating revenues	54,696,001	58,149,441
Misc. revenues	643,232	762,795
Total	$130,736,595	$144,565,712
Expenses including taxes	38,690,462	45,965,069
Net earnings	$ 92,046,133	$ 98,600,643
Deduct interest	11,944,094	16,928,796
Net income	$ 80,102,039	$ 81,671,848
Deduct dividends	56,984,688	64,390,659
Balance	$ 23,117,351	$ 17,281,189

Net income for the second quarter this year was $41,231,992, or $2.88 a share, compared with $39,601,273, or $3.03 a share, for the second quarter of 1929.

The following are the principal figures for the first and second quarters of 1930 and 1929:

	1930.	1929.
1st quarter gross revenue	$71,528,890	$65,305,654
2nd quarter gross revenue	73,036,822	65,430,941
1st quarter net earnings	49,284,285	46,384,501
2nd quarter net earnings	49,316,358	45,661,632
1st quarter net income	40,439,855	40,500,765
2nd quarter net income	41,231,993	39,601,274

Northern Ohio Company Shows Increase in Five Months' Net.

Operating revenues of the Northern Ohio Telephone Co., Bellevue, Ohio, for the first five months of this year were $4,996.34 greater than for the same period last year. Operating expenses show a decrease of $1,187.50 during the same period. The net available for dividends and surplus for the five months of this year was $62,900.05, compared to $55,957.64 for the first five months of 1929—an increase in net earnings of $6,942.41.

The total operating revenue from January 1 to June 1 was $393,667.60 compared with $388,671.26 for the same period last year. Total telephone operating expenses were $251,375.42 and $252,562.92, respectively, for the same periods. The gross income for the same periods was $107,192.76 and $100,445.60, respectively.

Total telephones connected May 31, 1930, were 27,690 or a loss of 193 stations over the end of May, 1929. Connected telephones were at their lowest point January 1, 1930, and since that date there has been a net gain of 204 telephones. This gain was due chiefly to the May employes' sales campaign.

Toll messages completed for the first five months of 1930 totaled 424,966, a decrease of 2,483 messages. The decrease in toll messages occurred in January. February, March, April and May of this year all show a gain in completed toll messages over the same months last year.

The percentage of offered calls talked on and completed was increased one-half of one per cent, making the percentage of completed toll calls to calls offered, just over 94 per cent. This represents about a 3 per cent increase in completed calls during the past three years.

On July 1 dividend No. 112 on preferred stock in the amount of 1¾ per cent for the second quarter of this year was paid and a dividend of 1 per cent on the common stock was paid on July 15 for the same period.

Company in Southeast Nebraska Reports Small Loss.

The Stella Telephone Co., of which R. A. Clark is president and manager and A. E. Camblina is secretary, reported to the Nebraska State Railway Commission for 1929 as follows:

Fixed investment, $35,684.80; total assets, $54,312.75; stock, $19,475; payables, $15,120; depreciation reserve, $11,359.80; surplus, $6,404.47.

Exchange revenues were $3,160.85; toll revenues, $269.67, making the total revenues, $3,430.52; maintenance expenses were $1,208.93; depreciation set-up, $54.27; total maintenance and depreciation, $1,263.20.

Traffic expenses were $600, and commercial, $1,268.74, making the total expenses, $3,131.94; operating income was $298.58; taxes, $83.28; interest, $308, and profit and loss (red), $92.70.

The company operated 256 telephones from its Stella exchange and 250 from its Shubert exchange. Its properties are now being operated by the Southeast Nebraska Telephone Co. of Falls City.

Newfoundland Company Refinancing with New Bond Issue.

Reports from St. Johns, Newfoundland, state that arrangements have been completed for refunding the outstanding bonded indebtedness of Avalon Telephone Co., Ltd., consisting of $380,500 of 6 per cent first mortgage bonds and $137,300 of 5½ per cent mortgage debentures, the former being redeemable at 105 and the latter at par, by the creation of a new first mortgage issue amounting to $750,000 of first mortgage 5½ per cent bonds.

The proceeds of the new bond issue will be for the most part used to redeem the present outstanding first mortgage bonds and mortgage debentures, but a certain portion of the proceeds will be used for capital expenditure in connection with the extension of the company's telephone system.

The Avalon Telephone Co. operates the entire telephone system of Newfoundland under exclusive franchise from the Newfoundland government. The company has been gradually extending its operations for several years past in order to keep pace with the continually increasing demand for telephone facilities, having in mind that the number of telephones per capita in Newfoundland is still much below that of similar districts in Canada.

Nebraska Company Reports Prosperous Year for 1929.

A prosperous year is reported by the Skeedee Telephone Co. of St. Edwards, to the Nebraska State Railway Commission. It is one of a number of properties in northeastern Nebraska, owned by E. C. Hunt of Blair. The company has a fixed investment of $45,831.75 and total assets of $50,376.

Other figures are: Stock outstanding, $20,000; payables, $4,000; depreciation reserve, $6,397.23; surplus, $19,260.05.

Exchange revenues were $11,141.48; toll revenues, $1,653.22, making the total revenues, $12,794.70. Maintenance and depreciation amounted to $4,464.

Traffic expenses were $2,605.50; commercial expenses, $2,861.81; total expenses, $9,931.31; the operating income was $2,863.39. Taxes paid were $600; dividends paid, $1,403.50; interest paid, $420, and $439.89 passed to surplus.

The company operates an exchange at St. Edwards, having 653 stations.

Pacific Bell Five Months' Earnings Off; May Revenues Gain.

Operations of the Pacific Telephone & Telegraph Co. in the first five months of 1930 resulted in net earnings after interest amounting to $6,248,249, as compared with $6,455,093 in the same period last year, a decrease of $206,844, according to the monthly report given out early this month.

The net income of $6,248,249 after taxes, etc., was equivalent after the six per cent preferred dividend requirements to $2.34 a share on 1,789,075 common shares, compared with $6,455,093 or $4.73 a share on 930,000 common shares in the same period last year.

Total operating revenues for the two periods were $43,372,443 in 1930, against $41,217,555 in 1929.

The company's net for the month of May was $1,606,537, as compared with $1,660,159 in April and $1,402,404 in May, 1929. Total operating revenues for May amounted to $8,879,281, as against $8,807,775 in April and $8,522,930 in May of last year.

Good Gain for 1929 Reported by Plainview Telephone Co.

The annual report of the Plainview Telephone Co. for 1929 to the Nebraska State Railway Commission shows:

Fixed investment, $37,434.65; total assets, $72,845.88;; stock, $24,812.50; depreciation reserve, $7,911.69; surplus, $49,263.69; exchange revenues, $9,903.35; toll

revenues, $2,099.29; miscellaneous revenues, $25.00; and total revenues, $13,773.14.

Maintenance expenses were $2,040; depreciation set-up, $360; total maintenance and depreciation, $2,400; traffic, $2,820.41; commercial, $1,108.00; total expenses, $6,808.68; operating income, $6,964.46; taxes, $561.20; and profit and loss, addition, $6,402.86.

The number of stations in the city is 354; rural, 162; switched, 288.

Class A Companies' April Reports Show Small Loss.

Compilations from reports of revenues and expenses for April, 1930, of 105 class A telephone companies, which were submitted to the Interstate Commerce Commission, show gross operating revenues of $99,836,576 as compared with $94,180,625 for the corresponding month of 1929, an increase of 6 per cent.

Operating expenses for April, 1930, were $67,259,570, an increase of 6 per cent over 1929. The operating income for the same month was $23,807,337, as compared with $22,652,898 of 1929, an increase of 5.1 per cent.

Operating revenues for the four months ending with April, 1930, were $391,607,322, as compared with $372,284,691 for the corresponding period in 1929, showing an increase of 5.2 per cent for 1930. Operating expenses for the same period were $265,670,323 and $247,066,896, respectively, showing an increase of 7.5 per cent. The operating income for the four months of 1930 amounted to $91,193,607, as compared with $92,678,123 for the same period of 1929, a decrease of 1.6 for 1930.

The companies, which include those having annual operating revenues over $250,000, had 17,071,003 telephones in service at the end of April, 1930, an increase of 4.9 per cent over that of 1929. Complete data for the Southeast Missouri Telephone Co., and the Texas Associated Telephone Co. were not available for inclusion in this report.

Financial Figures of Nebraska Telephone Companies Compiled.

Preliminary figures made up by Lawrence W. Kemmler, chief accountant for the Nebraska State Railway Commission, from the annual reports of the 185 telephone companies now under its jurisdiction, show that the investment in telephone properties in Nebraska increased more than 4½ millions, from $40,292,000 to $44,918,256. One million was in the Lincoln Telephone & Telegraph Co., from $11,437,000 to $12,358,000; two million in the Northwestern Bell Telephone Co. properties, from $21,945,000 to $23,724,000; and the remainder in all other companies, from $6,909,000 to $8,889,000.

Other assets increased from $2,276,000 to $2,490,000; those of the Lincoln company being $1,492,000 where a year ago the total was $1,394,000, and the others, the Bell not reporting, $998,775 instead of $883,137. Notes and bonds increased from $3,669,000 to $3,925,000, the Lincoln company's bonds remaining as before, $2,000,000.

No report was made by the Northwestern Bell company on the items of depreciation, surplus and undivided profits and total liabilities, because the company operates in four other states besides Nebraska and does not make a bookkeeping division as between the states.

The depreciation reserves of the Lincoln company increased from $2,745,979 to $2,852,840, and that of all other companies from $1,819,079 to $1,989,642. The total set up for replacements is $4,840,365, as compared with $4,565,059 a year ago.

The total surplus and undivided profits decreased for the year from $2,504,752 to $2,416,847; that of the Lincoln company increasing from $1,073,641 to $1,110,942, while all other companies decreased from $1,431,111 to $1,304,588. Total liabilities of all companies except the Northwestern Bell increased from $20,623,354 to $23,683,913; that of the Lincoln company from $12,831,863 to $13,851,093 and of all others from $7,431,111 to $9,837,989. Capital stock outstanding has increased from $8,296,725 to $11,389,469; that of the Lincoln company from $6,195,000 to $7,159,350 and that of all others from $2,100,800 to $4,230,869.

The tendency in the state is to merge into larger ownership units, and this has brought the number of reporting companies down to 185, which includes 33 of the small ones in Class F. Of the 152 in the other classes, but 77 paid dividends, and the greater number of these are included in group ownerships. Of the other 75, 35 reported a deficit at the end of the year. During 1928 65 companies paid dividends and only 27 went into the red through the year's operations. The 33 Class F companies are owned by 811 stockholders, where a year ago there were 847.

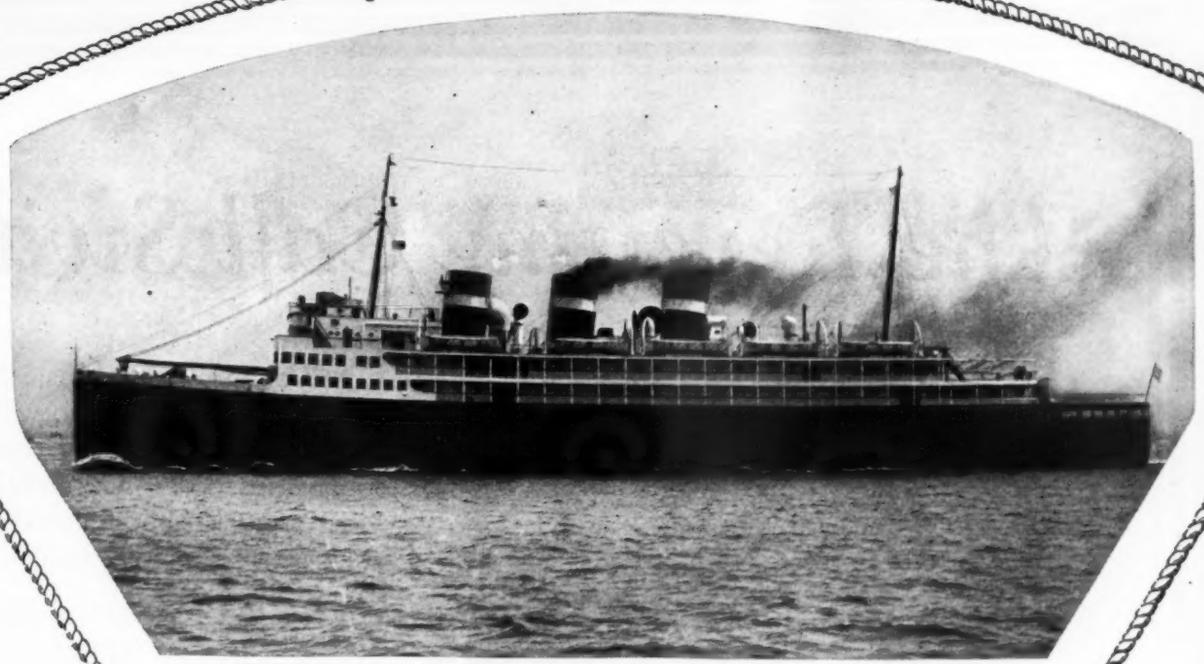
Stock outstanding has increased from $45,498 to $133,211; revenues decreased slightly, from $65,932 to $65,272. Where a year ago six reported paying dividends, only one is listed this year; disbursements decreased from $61,431 to $58,474; total subscribers decreased from 2,662 to 2,449, city subscribers decreasing from 1,013 to 990 and rural from 1,649 to 1,459; switched, increased from 1,405 to 1,791.

With the Northwestern Bell company in-

(*Continued on Page* 30)

Items.	Month of April		Increase or decrease (*)		Four months ended with April		Increase or decrease (*)	
	1930.	1929.	Amount.	Pct.	1930.	1929.	Amount	Pct.
Number of company stations in service at end of month	17,071,003	16,279,252	791,751	4.9				
Revenues:								
Subscribers' station revenues	$60,711,430	$56,911,638	$ 3,799,792	6.7	$239,399,264	$225,548,087	$ 13,851,177	6.1
Public pay station revenues	4,140,617	3,943,339	197,278	5.0	16,768,618	15,531,853	1,236,765	8.0
Miscellaneous exchange service revenues	891,179	789,620	101,559	12.9	3,583,962	3,069,314	514,648	16.8
Message tolls	27,356,459	26,637,024	719,435	2.7	105,184,055	104,836,749	347,306	0.3
Miscellaneous toll line revenues	4,025,575	3,488,338	537,237	15.4	15,917,150	13,690,929	2,226,221	16.3
Sundry Miscellaneous revenues	2,675,708	2,372,865	302,843	12.8	10,607,490	9,462,323	1,145,167	12.1
Licensee revenue—Cr.	1,221,014	1,165,311	55,703	4.8	5,033,914	4,776,896	257,018	5.4
Licensee revenue—Dr.	1,185,406	1,127,510	57,896	5.1	4,887,131	4,631,460	255,671	5.5
Telephone operating revenues	$99,836,576	$94,180,625	$ 5,655,951	6.0	$391,607,322	$372,284,691	$ 19,322,631	5.2
Expenses:								
Depreciation of plant and equipment	$15,722,190	$14,354,156	$ 1,368,034	9.5	$ 62,239,841	$ 57,045,638	$ 5,194,203	9.1
All other maintenance	16,420,488	15,736,335	684,153	4.3	64,430,944	59,432,139	4,998,805	8.4
Traffic expenses	19,743,698	19,312,732	430,966	2.2	78,779,848	75,988,638	2,791,210	3.7
Commercial expenses	9,362,675	8,857,935	504,740	5.7	37,221,469	34,486,413	2,735,056	7.9
General and miscellaneous expenses	6,010,519	5,203,214	807,305	15.5	22,998,221	20,114,068	2,884,153	14.3
Telephone operating expenses	$67,259,570	$63,464,372	$ 3,795,198	6.0	$265,670,323	$247,066,896	$ 18,603,427	7.5
Net telephone operating revenues	$32,577,006	$30,716,253	$ 1,860,753	6.1	$125,936,999	$125,217,795	$ 719,204	0.6
Other operating revenues	$ 77,228	$ 96,688	$ *19,460	...	$ 252,074	335,510	*83,436	...
Other operating expenses	53,796	77,241	*23,445	...	185,417	277,020	*91,603	...
Uncollectible operating revenues	759,092	615,631	143,461	23.3	2,955,300	2,346,410	608,890	25.9
Operating income before deducting taxes	$31,841,346	$30,120,069	$ 1,721,277	5.7	$123,048,356	$122,929,875	$ 118,481	0.1
Taxes assignable to operations	8,034,009	7,467,171	566,838	7.6	31,854,749	30,251,752	1,602,997	5.3
Operating income	$23,807,337	$22,652,898	$ 1,154,439	5.1	$ 91,193,607	$ 92,678,123	*$ 1,484,516	*1.6
Ratio of expenses to revenues, per cent	67.37	67.39	*.02	...	67.84	66.37	1.47	...

Comparative Statistics of 105 Class A Companies for April, Compiled From Reports to Interstate Commerce Commission.



STROWGER AUTOMATIC DIAL TELEPHONES AFLOAT

"WE are rapidly approaching the time when millions of telephone subscribers throughout the world will be able to converse with one another over any distance and between any two countries. It will no longer matter whether we are at sea, traveling through the air, or on land, facilities for communication will be available."

Thus spoke Sir Alexander Roger, Chairman of the Telephone Development Association of Gt. Britain.

Telephone intercommunication on this wide scale implies facilities aboard ship, not only for passengers on the same liner to converse together without actual personal contact, but terminal facilities for transoceanic telephony.

Already Strowger Automatic Dial Telephones have been impressed into this service and the new Canadian National Steamships, *Prince David*, *Prince Henry*, and *Prince Robert* are being equipped with Strowger Marine Automatic Exchanges, as is also the largest C. P. R. Liner, *Empress of Britain*, now on the stocks.

Automatic Telephone Manufacturing Co., Ltd.

Strowger Works, Liverpool, England

ASSOCIATED COMPANY

International Automatic Telephone Co., Ltd., London

ATM REG'D TRADE MARK

The Reverting Call Switch

BECAUSE of its basic simplici... ingenuity of design which is t... experience in automatic telephone ... equipment performs many functi... which, under other methods of op... quite intricate and difficult of accon...

The reverting call switch shown in ... tration offers a typical example ... consisting as it does of combination ... parts. By its means, reverting call ... ple manner, entirely automatically, ... own party-line, the caller merely ... number and hangs up his receiver. ... rung alternately with that of the ... party answers, which stops the ri... lifts his receiver and converses as u...

Due to its fundamental design, St... performs all necessary functions in ... direct manner possible, and with a ... The resulting advantages---economy ... of maintenance, and highly efficient ... ation---have been important factors ... outstanding name in dial telephony ...

Automatic Electric Inc.

Manufacturers of

STROWGER AUTOMATIC DIAL TELEPHONE AND SIGNALING SYSTEMS

Factory and General Offices: 1033 West Van Buren Street, Chicago, U.S.A.

Sales and Service Offices in All Principal Cities

GENERAL EXPORT DISTRIBUTORS

The Automatic Electric Company, Ltd., Chicago

In Canada . . . Independent Sales and Engineering Co., Ltd., Vancouver

In Australasia . . . Automatic Telephones, Ltd., Sydney

In Japan . . . Automatic Telephones Ltd. of Japan, Tokyo

ASSOCIATED COMPANIES

American Electric Company, Inc. . . . Ch...

International Automatic Telephone Co., Ltd., Lo...

Automatic Telephone Manufacturing Co., Ltd., Live...

The New Antwerp Telephone and Electrical Works . . . . . An...

STROWGE...

DIAL ST...

When writing to Automatic Electric Inc., please mention TELEPHONY.

mbol of Strowger Ingenuity

se of the
ty years'
Strowger
nd easily
ery often

ying illus-
ingenuity,
Strowger
in a sim-
rty on his
ial listed
then be
until that
aller then

equipment
and most
apparatus.
t cost and
able oper-
owger the
the world.

75% *of the world's automatic telephones are working on the Strowger System.*

UTOMATIC
STEMS

When writing to Automatic Electric Inc., please mentio TELEPHONY

(*Continued from page 26.*)

cluded, gross operating revenues increased from $10,873,111 to $11,476,759, but most of the increase went to pay increased operation costs. Of the total gross revenues, the Northwestern Bell company reported $6,533,559 as compared with $6,141,804 for 1928; the Lincoln company, $3,141,381, as compared with $2,994,584 for the preceding year; and all other companies $1,803,890 and $1,736,724 respectively.

Other income and revenues decreased from $83,627 to $64,674, the respective figures being: Northwestern Bell, 1928, $4,065, 1929, $9,279; Lincoln, $50,061 for 1929 and $61,334 for 1928 and all other companies, $5,334 for 1929 and $18,225 for 1928.

Operating expenses increased from $7,572,728 in 1928 to $8,197,210 in 1929. Those of the Lincoln company went up from $2,154,250 to $2,333,530; those of the Bell company from $4,106,890 to $4,448,209, and of all other companies from $1,311,587 to $1,383,868.

Taxes and miscellaneous charges show a decrease from $912,114 in 1928 to $897,304 in 1929. The Lincoln company shows a decrease from $232,787 to $214,985; the Northwestern Bell company a decrease from $591,842 to $589,618, while all other companies showed an increase from $87,485 to $92,070.

Interest payments increased from $230,650 to $242,824; the Lincoln company from $129,025 to $129,786, and all other companies (Northwestern Bell not reporting) from $101,625 to $113,152.

The Northwestern Bell company made no report of dividends paid on its Nebraska property, but the total of this item for all other companies increased from $557,256 to $597,371. Of this sum, the Lincoln company reported payments of $472,918 in 1929 where in 1928 it had paid $433,009, the remainder of the companies paying practically the same as the year before, $124,000 plus.

Payments of these dividends reduced the undivided profits account from $1,683,989 to $1,627,970. These represent the year's extra accumulations. Where a year ago the Northwestern Bell had $1,447,139 remaining after dividends, it closed 1929 with undivided profits of $1,471,128. The Lincoln company's addition to surplus was $40,221, where the year before it was $109,846. All other companies report $116,352 where the year previous the figure was $200,105.

The figures on stockholders and stations in service will be rechecked as they show a surprising difference. As totaled up, the number of stockholders decreased from 20,210 to 12,545; that of the Lincoln company from 1,680 to 1,328, and all others except Northwestern Bell, from 18,530 to 12,218.

The total number of stations has apparently increased 20,000 to 280,825, divided as follows: Business, 65,245, city, 141,431; rural 71,443; Lincoln company, business, 17,950; city, 41,832, rural, 23,685, total 83,467; Northwestern Bell, business 34,465; city, 67,688; rural, 9,747, total, 112,090; all others, business, 12,670; city, 31,901, rural, 38,011; total 85,265.

The number of stations switched for farmer-owned mutuals increased from 11,930 to 23,135.

Nebraska Company Reports Loss for 1929 to Commission.

The annual report of the Nuckolls County Independent Telephone Co., recently taken over by the Lincoln Telephone & Telegraph Co., filed with the Nebraska commission, shows that it failed to make expenses during 1929. A revision of rates schedules has since been undertaken. The figures are as follows:

Fixed investment, $170,808; total assets, $196,773; stock outstanding, $62,937; payables, $132,277; depreciation reserve, $10,675 (red); surplus, $13,651; exchange revenues, $24,621.58; toll revenues, $1,858.19; and total revenues, $26,464.97.

Maintenance and depreciation for 1929 were $9,000; traffic expenses, $8,755.66; commercial expenses, $5,049.05; total expenses, $25,936.72; operating income, $528.55; miscellaneous revenues, $165.35; taxes paid, $1,386.53; miscellaneous expense, $725.20; and to surplus, $1,418.13 (red).

The exchanges operated by the Nuckolls County company are Hardy, 242 telephones; Oak, 111; Nebson, 674; Nora, 105; Ruskin, 211; total telephones, 1,343.

Small Addition to Surplus by Nebraska Company.

The Oakdale Telephone Co., of which D. B. Daughhetie is president and Geo. Daughhetie is manager, reports to the Nebraska State Railway Commission as follows: Fixed investment, $19,769.25; total assets, $23,435.91; stock, $13,000; depreciation reserve, $4,350.54; surplus, $4,645.87; exchange revenues, $4,507.10; toll revenues, $762.04; miscellaneous revenues, $154.62; total revenues, $5,423.76; maintenance expenses, $2,158.93; depreciation set up (red), $390.73; total maintenance and depreciation, $1,768.20.

Traffic expenses for 1929 were $1,174.00; commercial, $1,086.75; total expenses, $4,028.95; operating income, $1,394.81; taxes, $305.11; and profit and loss, addition, $1,089.70.

The company operates 365 telephones from its exchange at Oakdale.

Assets of A. T. & T. Co. to Exceed $3,000,000,000 as Rights Expire.

Total assets of the American Telephone & Telegraph Co. will exceed $3,000,000,000 for the first time in history on August 1, when the current rights to buy additional shares expire, if the same proportion of stockholders as in former years elects to pay for additional shares under the single payment plan. In both 1928 and 1926 nearly 84 per cent of stock offered in those years was paid for in full on August 1.

At the mid-year the assets of the company amounted to about $2,845,000,000, comparing with $2,704,000,000 on March 31 and $2,477,000,000 on December 31, 1929. The company is offering $257,940,700 additional stock to holders of record of May 23 at $100 a share and on a one-for-six basis. If 84 per cent of subscriptions are made on August 1, not including first payments under alternate installment subscription plans, more than $215,000,000 will have been added to the company's assets on that date.

The A. T. & T. stock offering is the largest issuance of capital stock in the history of the company and of American industry and represents in the aggregate an amount superior to the outstanding capital of all but a few corporations in this country. More than 500,000 stockholders received 750,000 warrants on or about June 9, last.

An indication of the amount of work involved in handling a stock issue of this size, which compares with a previous high record offering of $185,863,000 stock by the company in 1928, is shown by the fact that 435,000 of the 750,000 warrants mailed by the company were fractional warrants representing less than six rights, which will have to be matched up in order to be utilized in subscription.

In accordance with the practice developed and improved in former years, the company has set up a large clerical machine to handle all correspondence and other work in connection with the stock subscriptions. The number of extra employes this year is running ahead of the number so engaged in 1928, due to the work involved in handling conversions of bonds prior to May 23. All but $13,657,900 out of the $219,112,700 of convertible 4½s sold in 1929 was converted on or prior to the record date for stock entitled to rights.

Every possible effort is being made to prevent stockholders from losing the value of their rights through failure to exercise or sell them. Special letters have been sent to stockholders who did not use their rights in 1928, and the telephone company has communicated to all the associated telephone companies of the Bell system the names and addresses of persons who need assistance, based on the experience of former years.

The disbursement of more than $34,800,000 in dividends on July 15 was a record quarterly dividend payment by the company and exceeds any similar distribution ever made by an American corporation.

In 1900 the company's stockholders owned on an average 76 shares each, comparing with an average holding of only 30 shares at present. The capital of the company has been multiplied 27 times in the past 30 years, although the average hold-

ing is less than half. Of the present stockholders, 470,000 own fewer than 100 shares, 395,000 own 25 shares or fewer, and 190,000 own from one to five shares.

As a result of the issuance of 2,579,407 additional shares, the outstanding capital stock of the American Telephone & Telegraph Co. on August 2 will be within 1,546,338 shares of the authorized total of 20,000,000.

Short-Term Financing of East Coast Utilities Co.

Short-term financing for the East Coast Utilities Co., a subsidiary of the Empire Public Service Corp., amounting to $900,000 was done early this month by a syndicate headed by J. A. W. Iglehart & Co. of Baltimore and the Baltimore Co. and including the Citizens & Southern Co. of Savannah, the First National Co. of Atlanta and the South Carolina National Bank of Charleston.

The syndicate marketed an issue of 6 per cent convertible secured notes, due on July 1, 1932, which are secured by the deposit with the trustee of $37,000 of Series A and $1,229,500 of Series B first mortgage collateral bonds.

Each $1,000 note is convertible, at the option of the holder, until July 1, 1931, into 50 shares of Class A common stock of the parent company, the Empire Public Service Corp., and thereafter to maturity into forty shares. The borrowing corporation operates, through subsidiaries, electric light and power and telephone properties in Virginia, North Carolina and Delaware.

Western Power Light & Telephone Co. Offers New Issue of Bonds.

Offering of a new issue of $4,000,000 5½ per cent gold bonds, of the Western Power Light & Telephone Co. was made late last month by a syndicate composed of A. B. Leach & Co., Inc., Halsey, Stuart & Co., and Central-Illinois Co. The bonds, dated March 1, 1930, and maturing on March 1, 1931, were priced at 99.67 and accrued interest, to yield 6 per cent.

The Western company owns public utility companies operating in Missouri, Kansas, Oklahoma, and Texas. The company is now expanding these operations by adding to its system public utility properties in Iowa, Nebraska, Kansas, and Colorado. Subsidiaries own various properties in the Southwest and will furnish telephone service in 160 communities. The number of electric, gas and water customers, and of telephone subscribers exceeds 75,000, and the population supplied with one or more of these services is estimated at more than 400,000.

The total depreciated value of the properties owned and now being acquired plus the cost of subsequent additions and extensions to March 31, 1930, it is stated, is largely in excess of the total funded debt of the company including this issue of notes, and mortgage bonds and preferred stocks of subsidiaries are to be outstanding in the hands of the public, upon completion of proposed financing.

Michigan Bell Pays $6.02 Taxes on Each Telephone.

The net earnings from 217,000 telephones were required to pay the Michigan Bell Telephone Co.'s total 1929 tax bill of $3,966,000, it was indicated when the state of Michigan received its portion, $3,227,943.37, on June 30. The company's state tax was paid in the form of a check to Auditor General O. B. Fuller, and goes into the Michigan primary school fund. The total tax payment represents $6.02 for each telephone in service during 1929.

Since 1911, the Michigan Bell Telephone Co. has paid into the state treasury more than $20,250,000, of which $12,254,000 has been paid during the last five years, the records show. The tax paid the state by the telephone company this year was $428,870.97 larger than that paid a year ago.

In addition to the state tax, federal taxes paid by the company this year amounted to more than $700,000, and miscellaneous local taxes totaled approximately $10,000.

Assessed valuation of the company was set at $102,017,500, an increase of $10,017,500 over the 1928 assessment. Of that total, $17,500 represents the assessment on three small companies purchased by the Michigan Bell company this year. The tax rate was $31.64 per $1,000, the highest ever levied.

The state tax paid this year is the largest in the company's history. The total tax paid by the company for 1929 amounts to $10,866 per day.

Current Price Quotations on Listed Telephone Stocks.

	July 19, 1930 High.	Low.	Last.
American Telephone & Telegraph Co.	220½	216¾	217
American Telephone & Telegraph Co. rights	19¾	17⅜	18⅞
Associated Telephone & Telegraph Co., A	67	66	66½
Associated Telephone & Telegraph Co., pfd. (6)	94	91½	94
Associated Telephone Utilities Co.	23½	22½	23¼
Cincinnati & Suburban Bell Telephone Co.	96¼	96¼	96¼
Community Telephone Co.	20	20	20
Chesapeake & Potomac Telephone Co., pfd.	117⅝	117⅝	117⅝
Diversified Investments, Inc.	54	53¾	54
Empire Public Service Co.	17½	17½	17½
International Telephone & Telegraph Corp.	49⅞	44⅞	47¾
Mid-west States Utilities Co.	23¾	23	23¾
New England Telephone & Telegraph Co.	142	141⅞	141⅞
Pacific Telephone & Telegraph Co., com.	141½	134	138
Pacific Telephone & Telegraph Co., pfd.	126¼	125½	125¾
Western Power, Light & Telephone Co.	26	25½	26

OVER THE COUNTER QUOTATIONS

	July 19. Bid.	Asked.	July 18. Bid.
Associated Telephone Utilities Co., $6, pfd.	84	..	..
Associated Telephone Utilities Co., $7, pfd.	95	..	..
Bell Telephone Co. of Canada	149	152	149
Bell Telephone Co. of Pennsylvania	113	116	113
Cuban Telephone Co., 7, pfd.	97	102	97
Diversified Investments, Inc., part. pfd.	66½	68½	..
Lincoln Telephone & Telegraph Co.	120	..	120
Mountain States Telephone & Telegraph Co.	143	147	143
National Telephone & Telegraph Corp., pfd.	103	105	..
New York Telephone Co., pfd.	20	24	20
Northwestern Bell Telephone Co., pfd.	107	..	107
Peninsular Telephone Co.	23½	26	23½
Peninsular Telephone Co., pfd.	107	108	107
Porto Rico Telephone Co.	85	..	85
Porto Rico Telephone Co., pfd.	100	..	100
Rochester Telephone Corp., 1st pfd.	106½	..	106½
Southern New England Telephone Co.	169	175	167
Southwestern Bell Telephone Co., pfd.	119	121	119
Wisconsin Telephone Co., pfd.	112	..	..

Big Debenture Issue of Associated T. & T.

Company Representing Combination of American and British Financial, Manufacturing and Operating Interests Puts Out $10,000,000 Debenture Issue—Data Relative to Company—Statistics and History of Organization

Offering of $10,000,000 Associated Telephone & Telegraph Co. 5½ per cent debentures, Series A, due May 1, 1955, was made early this month by the Bancamerica-Blair Corp. and Harris, Forbes & Co., at 94½, to yield more than 5.90 per cent. The bonds will be callable as a whole or in part at 105 up to May 1, 1945, with the premium decreasing one-half of 1 per cent for each year thereafter to May 1, 1954, when the issue will be redeemable at par.

Proceeds from the sale will be used for acquiring control of additional manufacturing properties, for the payment of contract obligations and of current indebtedness and for improvements to telephone plants and for other corporate purposes. The company has no funded debt other than this issue. Consolidated earnings for 1929, after taxes, depreciation and all interest and dividend charges of subsidiaries, were equivalent to eight times the annual interest charges on this issue, it is stated.

The Associated Telephone & Telegraph Co., incorporated March 1, 1926, under the laws of Delaware, represents a combination of American and British financial, manufacturing and operating interests of long and successful experience in the telephone business and allied industries. The company owns and controls through stock ownership, directly or indirectly, of companies engaged in the manufacture of automatic telephone equipment, operating telephone companies outside the United States, and other companies doing a related business.

The telephone equipment manufacturing companies controlled directly or indirectly by the Associated Telephone & Telegraph Co. are Automatic Electric Inc., Automatic Telephone Mfg. Co., Ltd., of Liverpool (controlled in conjunction with British Associated), and New Antwerp Telephone & Electrical Works, Ltd., Antwerp, Belgium.

Automatic Electric Inc. (controlled by 100 per cent ownership of common stock), and its successor companies represents the pioneer organization in the development and manufacture of automatic telephone equipment. The type of apparatus manufactured by the company is known as Strowger automatic telephone equipment, and was originated some 40 years ago.

Another important product of Automatic Electric Inc. is the P. A. X. (private automatic exchange) apparatus for private internal communication systems, which may be operated either separately or in connection with the local telephone installation.

The products of the manufacturing companies are sold throughout the world to the principal users of telephone equipment which include the leading Independent telephone companies in the United States, the operating companies of the American Telephone & Telegraph Co., and the Associated Bell system, the government telephone systems of Great Britain and Australia, the Japanese government, and many other governmental and privately-owned systems. Over half of the Strowger automatic equipment is sold under long term contracts.

The principal owned telephone operating companies of the Associated Telephone & Telegraph Co. are:

The British Columbia Telephone Co., the second largest telephone company in the Dominion of Canada, controlled through the ownership of 99.95 per cent of its common stock by National Telephone & Telegraph Corp., all of the common stock of which is owned by Associated Telephone & Telegraph Co. Together with four other subsidiary companies the British Columbia Telephone Co. owns about 97 per cent of the telephones in British Columbia, Canada, serving a territory with a population of approximately 500,000 people, including the metropolitan areas of Victoria and Vancouver.

These companies have in service over 118,000 telephone stations and 5,815 miles of toll circuits. The long distance lines of the company connect with the Province of Alberta on the east and form an integral part of all trans-Canadian toll lines. They are also connected with the lines of the Bell system throughout the United States.

The Anglo-Portuguese Telephone Co., Ltd., controlled through ownership of stock having a majority of the voting power, operates without competition the telephone systems in Lisbon (the capital) and Oporto, the principal cities of Portugal, having an aggregate population of about 680,000.

Compania Telefonica de Barranquilla serves Barranquilla, Colombia, South America, a city of approximately 90,000 inhabitants.

The Associated Telephone & Telegraph Co. also has important investments in telephone companies in Colombia, Jamaica, Santo Domingo and is negotiating acquisitions and contacts in other countries.

The properties outside of Continental North America are situated in localities having at present a low telephone development, thus offering opportunities for large growth, already in process of being realized. The franchises and concessions held by the telephone operating companies are, in the opinion of the management, satisfactory for the operation of the business.

Classification of Stock According to Priority	Shares Authorized	Shares Issued	Shares in Hands of Public	Par or Stated Value Per Share	Par or Stated Value Amount	Liquidating Values Per Share Voluntary or Redemption	Liquidating Values Per Share Involuntary
First preferred 7 per cent cumulative	100,000	35,000	34,682	$100	$3,468,200	$125.00	$100
$6 cumulative	100,000	30,000	28,500	90†	2,565,000	115.00	100
Class D, $4 cumulative	50,000	50,000*	44,329	50†	2,216,450	62.50	50
Class A, $4 cumulative and participating	200,000	107,084	92.084**	Various†	4,870,350	105.00	50
					$13,120,000		
Common	400,000	356,452	256,452	5†	1,782,260		
					$14,902,260		

*5,352 shares held as treasury stock.
**Does not include 15,000 shares held in escrow for exercise of stock purchase warrants attached to $6 preferred stock.
†No par value.

Capital Stock of Associated Telephone & Telegraph Co. and Data Concerning It.

Capitalization.

The aggregate amount of capital stock outstanding at its par value or stated value was $14,902,260.00, as of December 31, 1929. The capital stock of Associated Telephone & Telegraph Co. in the hands of the public, as of December 31, 1929, is given in the accompanying table.

Dividends have been paid regularly on all preferred and preference stocks since issuance, a participating dividend of 25 cents a share was declared on the Class A stock to stockholders of record on December 17, 1929, payable January 1, 1930; $2 a share extra dividends were declared on June 24, 1930, payable $1 on August 1, and $1 on November 1, 1930, to stockholders of record July 17, 1930, and October 17, 1930, respectively.

Earnings and Assets.

Gross earnings and gross profits on sales for 1928 amounted to $10,701,622.52. Net earnings after all expenses and taxes, including federal income taxes and after provision for depreciation, amounted to $3,037,860.57 for 1928. Gross earnings and gross profits on sales for 1929 amounted to $13,321,582.62. Net earnings after all expenses and taxes including federal income taxes and after provision for depreciation amounted to $4,687,187.25 for 1929.

Total consolidated assets of the Associated Telephone & Telegraph Co. and subsidiary companies, as indicated by the consolidated balance sheet for 1928, amounted to $53,648,778.20. On December 31, 1929, total consolidated assets on the same basis amounted to $68,289,198.92. The pro forma balance sheet of June 30, 1930, prepared in connection with the issuance and sale of $10,000,000 par value, 30-year 5½ per cent gold debentures offered, indicates consolidated assets of $73,034,293.57.

Consolidated net earnings after all prior charges, including depreciation, for the year 1928 amounted to more than five times the dividend requirements upon the first preferrred stock at the end of the year.

Earnings applicable to the junior preference stock of the company were more than three times the dividend requirements for the year ending December 31, 1929. Consolidated net income after all prior charges, including depreciation, amounted to more than seven times the dividend requirements on the first preferred stocks outstanding, and earnings per share upon the Class D and A stocks were in excess of $17 per

	1929	1928
Gross earnings and gross profits	$13,321,583	$10,701,622
Operating expenses, maintenance and taxes including federal incomes taxes and depreciation	8,634,395	7,663,762
Net earnings	$ 4,687,187	$ 3,037,860
Dividends paid	877,916	479,586
Surplus for year	2,612,148	924,762
Profit and loss surplus	2,152,650	645,969

Comparative Income Account of Associated Telephone & Telegraph Co. of Chicago for Years Ended December 31, 1929 and 1928.

share for each class of stock outstanding at the end of the year.

Current Position.

The requirements for working capital are relatively small. All borrowings on the part of the company or subsidiaries on behalf of the operating telephone company division of the business represents in most instances temporary borrowings incurred in connection with the acquisition of capital assets and are ordinarily refunded into permanent capitalization within a year after date.

The need for current borrowings on the part of the manufacturing companies is also materially less than in most manufacturing situations, due to the fact that under contract agreements the factories may receive up to 70 per cent of the face amount of billings as advances from companies to which equipment has been sold for later delivery. Such borrowings, in large measure, take care of the requirements for temporary financing of equipment while in process of manufacturing.

The current assets of the Associated Telephone & Telegraph Co. and subsidiaries are shown by the consolidated balance sheet of 1928 as $9,541,570, with current liabilities of $5,086,499. The consolidated balance sheet of 1929 shows current assets of $12,783,611 and current liabilities of $8,254,118.

The pro forma balance sheet of June 30, 1930, showed a further improvement, after giving effect to the debenture financing, with current assets of $14,678.060, and current liabilities of $7,754,118.

Book Values.

Plant, properties, rights and franchises of the Associated company were shown on the balance sheet of December 31, 1928, at $26,487,652 for the telephone operating companies. Plant and equipment of manufacturing companies were carried at $5,255,555. Other asset items of manufacturing companies were carried at $6,739,193, making a total of $38,482,402 fixed assets as of that date.

Plant, property, rights, franchises, etc., were shown on the balance sheet of December 31, 1929, at $35,538,887. Other asset items were carried at $6,065,038, making a total of $41,603,925 fixed assets as of that date.

On the basis of preliminary appraisal of telephone operating companies made by J. G. Wray & Co., consulting engineers, and appraisals of the manufacturing companies made by American Appraisal Co., including subsequent additions at cost and less depreciation, reserves amounted on December 31, 1929, to $10,329,985, exclusive of patents, trade marks, good will, etc. The consolidated net assets amounted to $26,354,219.

The funded debt consists of $10,000,000 25-year 5½ per cent gold debentures, due May 1, 1955.

The officers and directors of the Associated Telephone & Telegraph Co. are men of extensive and successful experience in corporate management and include men who have been prominently identified with the telephone business and affiliated enterprises for many years in the United States, Great Britain and elsewhere.

The officers are: E. A. Mellinger, chairman; E. C. Blomeyer, vice-chairman; J. W. Perry, president; Sir Alexander Roger, vice-president; H. L. Harris, executive vice-president; J. G. Crane, vice-president; L. W. Howell, vice-president; G. L. Grawols, vice-president and treasurer; and R. J. Munro, secretary.

The directors are: Theodore Gary, A. F. Adams, H. L. Gary, E. C. Blomeyer, C. A. Bennett, J. G. Crane, L. E. Durham and J. W. Perry, Kansas City, Mo.; F. H. Woods and Thomas C. Woods, Lincoln, Neb.; H. L. Harris and L. W. Howell, Chicago, Ill.; E. A. Mellinger, Sir Alexander Roger, G. W. Moore, and Eric Taylor, London, England; George K. Gann, Henry C. Woods, G. L. Grawols and R. J. Munro of Chicago, Ill.

History of Company.

The Associated Telephone & Telegraph Co. was organized in Delaware on March 1, 1926, and represents an alliance of American and British financial and operating interests of long and successful experience in the telephone business and allied industries.

In November, 1926, it took over Compania Telefonica de Barranquilla, an operating company in Barranquilla, Colombia. This company, together with Compania Telefonica del Pacifico, acquired in June, 1929, furnish as telephone service to a population of approximately 90,000 in and throughout Cali and Barranquilla, Colombia.

In December, 1926, the company acquired the Cable, Telephone & General

Assets:	1929	1928
Plant, property, rights, franchises	$35,538,887	$31,743,208
Patents, trade marks, goodwill	6,065,038	6,739,193
Investments in and advances to other companies	9,153,037	5,058,059
Deferred charges and due from affiliated companies	4,748,726	546,747
Current Assets:		
Cash in banks, on hand and in transit	$ 1,311,701	$ 1,850,244
Special deposits	54,226	51,541
Notes and accounts receivable	4,338,345	3,332,952
Costs on installation contracts not billed	1,206,998	.....
Merchandise and materials	5,872,241	4,306,833
Total current assets	$12,783,511	$ 9,541,570
Total assets	$68,289,199	$53,648,778
Liabilities:		
Capital stock of Associated Telephone & Telegraph Co.	$14,902,260	$ 8,832,890
Preferred and other non-controlling stocks of subsidiaries in hands of public	11,493,577	11,487,672
Minority interest in controlling stock and surplus of subsidiaries	8,830,591	7,609,295
Funded debt of subsidiary companies in hands of public	4,822,883	2,744,192
Deferred liabilities	2,841,209	2,894,521
Due from affiliated companies	249,056	861,712
Current Liabilities:		
Notes payable	$ 900,160	$ 1,500,000
Accounts payable	2,104,218	2,772,311
Advances received under manufacturing contract	2,629,966	.....
Liability on uncompleted installation contracts	829,844	.....
Accrued interest and dividends	610,756	431,756
Accrued taxes	827,410	332,203
Other liabilities	351,763	50,229
Reserves:		
Depreciation	$10,329,985	$ 9,535,064
Contingencies, pensions, etc	3,998,123	3,349,685
Paid-in surplus	414,746	601,276
Surplus—since dates of acquisition	2,152,650	645,970
Total Assets	$68,289,199	$53,648,778

Comparative Balance Sheet of Associated Telephone & Telegraph Co. as of December 31, 1929 and 1928.

Trust, Ltd. (London, England), which at that time had the controlling interest in International Automatic Telephone Co., Ltd. (London, England), a sales and engineering company, and Automatic Telephone Mfg. Co., Ltd., (Liverpool, England), a manufacturing company. The Cable, Telephone & General Trust, Ltd., in November, 1927, acquired control of the Anglo-Portuguese Telephone Co., Ltd., operating in Lisbon and Oporto, Portugal.

Also in December, 1926, Automatic Telephones Ltd. of Sydney, Australia, a sales company marketing products of the Automatic Telephone Mfg. Co., Ltd., and Automatic Electric Inc., was acquired.

The Associated Telephone & Telegraph Co. in June, 1927, acquired the National Telephone & Telegraph Corp., at that time called the British Columbia Telephone & Telegraph Co. The National Telephone & Telegraph Corp. at the time of its acquisition by the Associated Telephone & Telegraph Co., owned only the British Columbia Telephone Co., an operating company with offices in Vancouver, B. C.

The National Telephone & Telegraph Corp. has since acquired control of a number of other operating companies in British Columbia: in March 1928, Kootenay Telephone Co., Ltd.; November, 1928, Chilliwack Telephones Ltd.; May, 1929, North West Telephone Co.; and December, 1929, Mission Telephone Co., Ltd. These companies serve a population of approximately 750,000 in British Columbia.

The Independent Sales & Engineering Co., Ltd., a sales company, is also owned by the National Telephone & Telegraph Corp. This company handles the products of Automatic Electric Inc., and the American Electric Co., Inc., and also numerous outside companies.

The Associated Telephone & Telegraph Co. also owns the Automatic Electric Co., Ltd., acquired in July, 1927. This is a foreign sales company, selling products manufactured by the various associated manufacturing companies.

The Associated company has controlled Automatic Electric Inc., a manufacturing company, since December, 1927. A holding company, Automatic Products Corp., acquired by the Associated company in July, 1928, now owns Automatic Electric Inc. and Reserve Holding Co., acquired in January, 1927, holds the patents for Automatic Electric Inc.

In May, 1928, the Associated Telephone & Telegraph Co. acquired control of the New Antwerp Telephone & Electrical Works, located in Antwerp, Belgium.

Telephone Calls Increase Fast in Switzerland.

The use of the telephone in Switzerland is making enormous strides, according to the authorities in Geneva. The figures for 1929 show an increase of over 1,000 telephone subscribers, while public telephone calls have increased by nearly 5,000.

Programs at District Meeting

(*Concluded from page* 21.)

out plans operative in our respective territories and begin the use of them at once, or suffer the indignity of being elbowed into the background of the picture. We would never be forced entirely out, for the telephone is a necessity; but we would be deprived of that margin which makes for satisfaction in being a part of a business that is prospering."

He then offered some suggestions for devising a working plan for companies, saying that: "In addition to the use of a well-planned campaign at least once a year, I would suggest that every employe be supplied with what is known as 'tip' cards to be used the year round. These are cards for noting down the names and addresses of possible new subscribers or old ones who might need additional service and should be filled out by employes on the slightest suspicion that they know where a sale might be made.

"The cards should then be submitted to the commercial department for following; and if the follow-up proved successful, the person submitting the card should be given credit for the suggestion on a bulletin designed for that purpose.

We can get much information from an analysis of the reasons for 'Out Orders' also. Let every company require every employe to note on his memorandum for an out order the reason assigned by the subscriber for ordering the phone out. Our company has been doing this for nearly a year and we have accumulated some interesting statistics on this subject.

Each time we receive an out order we try our best to save it, unless the subscriber is moving entirely out of the territory we serve. This can be accomplished sometimes by suggesting a less expensive class of service, as the subscriber who is used to telephone service knows he is giving up something he really wants, and it is only necessary to convince him that his telephone is more useful than something else he is going to spend that amount for each month."

In conclusion, he suggested: "Inasmuch as the public is now thoroughly monthly payment conscious, I have often thought that this situation might be helped if the service connection charge could be spread over several months and paid at the rate, say, of 50 cents per month with the regular monthly billing. This would involve more bookkeeping on each subscriber who wished this plan for the first several months, but it might be worth it in added business."

Both conferences gathered for lunch at the Masonic Temple, where the Eastern Star served a meal which drew a resolution of thanks at adjournment. President Pitcher presided over the luncheon program, calling upon David Davis, local manager of the Illinois Light & Power Corp., and Richard A. Lumpkin, president of the Illinois Consolidated Telephone Co., for brief talks.

The surprise of the luncheon was the "Linemen's Quartet," made up of employes of the Illinois Southeastern Telephone Co., Mattoon. The quartet sang in typical college glee club manner several popular songs and a parody on McDonald's Farm, in which the comical peculiarities of many well-known telephone men in attendance were made known. The quartet made a great hit with the diners.

The afternoon program of the men's conference was given over to the discussion of transmission design and maintenance of local exchange plant. This part of the program was presented with the aid of a stereopticon by Mr. Boesenberg and Mr. Talmage. The Illinois association now furnishes both transmission maintenance service and transmission design information for all Illinois telephone companies.

It was suggested by those in the men's meeting that additional transmission maintenance bulletins, similar to that on "Maintenance of Distributing Frames," be issued at regular intervals and a wide distribution made of the material, not only to the general offices of the companies but to every plant man within the company organization.

The men's meeting closed with a splendid tribute by Walter Knowles, well known telephone executive of Clinton, Ill., who praised the work of the Illinois association and especially the high standard of the programs of the district meetings held recently.

The traffic conference was in charge of the Illinois association's traffic supervisor, Mrs. Mayme Workman. This school of instruction was held separate from the men's meeting. Blackboard diagrams and examples were freely used in the traffic conference.

Special effort is made to have the operators ask questions in order that their problems may be discussed. Each delegate is urged to drop a written question into the question box during the morning conference. As many as possible of the questions were answered in the meeting. Those remaining unanswered in the conference are followed up by letter as soon as possible.

Those winning prizes, based on the questions they asked, were: First prize, Miss Pauline Wilson, toll operator, Hillsboro; and second, Miss Allie Jolly, local operator, Taylorville.

The next three district meetings of the Illinois association are scheduled as follows: Rockford on July 30, Clinton on September 3 and Streator on September 17.

Commission Rules on Telechronometers

Washington Department of Public Works Orders Use of Metering Device Discontinued in Everett, Wash., and Vicinity After Several Years' Operation—History of Case—Findings of Fact and Opinion of State Regulatory Body

Early this month the Washington Department of Public Works ordered the West Coast Telephone Co., successor to the Puget Sound Telephone Co., to discontinue the use of telechronometers in Everett, Wash., and vicinity and to disconnect and remove the instruments and appliances from its telephone plant. The company is further ordered to return to flat rate service at the rates in effect in 1926 and to file the tariffs or supplements to tariffs required to make such rates effective. The company is given until October 1, 1930, to make the changes ordered.

In its "finding of fact" the regulatory board says:

Finding of Fact.

"The department finds that under the telechronometer operation, as compared to the former flat rate service, a larger number of subscribers is paying a substantially larger sum, is making fewer calls, is talking for shorter periods of time, and that the telephone company is receiving less on its investment.

The reduction or economy in plant investment claimed by the telechronometer interests is entirely theoretical and can be realized only in the distant future, if at all. The department is of the opinion and finds that the telechronometer system is improper, inefficient and unsuitable for use on the Everett telephone exchange."

The order issued by the Washington Department of Public Works on July 1 was in a proceeding instigated by patrons of the telephone company to determine whether the telechronometer system should be continued in use in Everett. The telechronometer is a patented device for measuring the use of the telephone in units of time, and its use in the state of Washington is confined to the city of Everett.

Telechronometers were first introduced in Everett in 1921. On April 1, 1922, the Washington Department of Public Works ordered the telephone company to operate on metered rates for a period of 60 days. On September 25, 1922, the telephone company was ordered to return to the former flat rates.

In 1923, the department ordered the telephone company to disconnect and remove the telechronometers then attached to its plant and to refund to certain subscribers a portion of the charges paid while telechronometers were in service. In 1926, the department by order required the telephone company to return to the telechronometer system of measuring charges on or before January 1, 1927.

"At all times," says its opinion, "the city administration of Everett and a considerable proportion of the people have been opposed to the telechronometers. Every installation of the system was bitterly contested before the department and in some instances before the courts."

Conflicting Claims

The present proceeding was initiated by the filing with the department of petitions containing 5,665 signatures protesting against the continuation of the telechronometer system in Everett. During the hearing and throughout the period of agitation, the telechronometer interests claimed that the opposition to the telechronometers was confined to a small number of people; whereas, the opponents at the same time claimed that most of the telephone users were opposed to the system.

In an effort to determine this question, the telephone company, subsequent to the hearing and at the suggestion of the department, mailed 8,100 cards to its subscribers, addressed to the Department of Public Works, and set up to allow a vote on the following propositions:

"Continue the use of the telechronometer .....?

"Discontinue the use of the telechronometer and return to flat rates.....?"

The tabulation of the vote in the department showed 2,318 in favor of the continued use of the telechronometer, 2,316 against; and 3,466 not participating in the ballot.

"This poll," the opinion states, "was conducted after the hearing and the result could not, of course, influence the determination. Moreover, the present board does not believe the propositions submitted were sufficiently broad to make the poll decisive. The ballots as printed tacitly offered a choice between the continuance of the telechronometer system under the present rates or a return to flat rates, while the record in the case shows that the telephone company is not now earning a reasonable return upon its Everett investment.

Value of Poll on Telechronometers.

"The poll taken at its face value offers little comfort to the telechronometer system. A public utility company following a practice which is regarded by a substantial percentage of its patrons, after an experimental period of some eight years, as improper and unreasonable is bound to have difficulty. The dissatisfaction will affect its public relations in all departments of its business.

Of course, it can be argued that a return to flat rates would violate the wishes of those favoring the telechronometer. That is undoubtedly true, but whether these subscribers would continue to favor the telechronometer under increased rates is another question.

However, it is apparent that this telechronometer question in Everett must be settled. It has been with us for nearly ten years. Orders final on their face and continuing the telechronometer in use have merely resulted in further agitation and dissatisfaction. Other communities and telephone systems operating under flat rates do not present a continued agitation, and it is reasonable to hope that the people of Everett, if again placed on a parity with the other telephone users throughout the state, will be contented."

The West Coast Telephone Co. remained neutral in the controversy. It offered no witnesses and did not cross-examine witnesses offered by other parties. Certain of its officers and employes who testified at the hearing, did so in response to subpoenas issued at the request of complainants and testified as witnesses of complainants. The actual defense was conducted by the telechronometer interests.

Hearing on Complaints.

Complainants were aided in the proceedings by a capable engineer who made certain engineering studies and testified in their behalf at the hearing. In all former proceedings the opponents of the telechronometer had been without the assistance of expert engineering witnesses and had been forced to rely upon the engineering services of the department and upon the ingenuity of their counsel. A long and tedious hearing was held during which more than 1,500 typewritten pages of testimony were taken and more than 60 exhibits were offered. During the course of this proceeding many intricate propositions were offered for the consideration of the department.

The last installation of telechronometers in Everett was made in accordance with the order of the department dated March 31, 1926.

"The telechronometer was not then in operation," the opinion continues. "Had the glowing promises been realized in actual operation, probably the complainants herein would admit that the telechronometer system was desirable; however, complainants contend that the promises made have not been realized to any considerable degree.

"Before proceeding further, it may be well to state that the department as now constituted is by no means convinced of

the theoretical correctness of metered telephone service, and is not convinced that telephone service can be properly compared with electrical, gas or water service where metering is common.

In these other services a commodity is furnished to the customer while with the telephone, nothing but the use of the line is offered. If there is any commodity involved, it is conversation which is produced by the users. The amount of gas, water or electricity taken by patrons has a very direct relation to the cost of furnishing the service, but the record herein wholly fails to demonstrate that the amount of use to which patrons put their telephones has any direct relation to cost.

Time and again complainants challenged respondent so to demonstrate but respondent did not even make a serious effort. Manifestly an increase in the use of the telephone would not increase operating costs unless the line or the central office equipment was approaching saturation.

The customary argument in favor of the telechronometer system is that it tends to decrease unnecessary use of the telephone, which enables the company to serve more customers in a satisfactory manner with the same equipment and keeps down the investment and consequent increase in rates. The partial truth of this proposition may be admitted.

Daily Calls in Everett.

"The record shows that the average daily calls in Everett decreased from 55,000 in 1926 to 46,000 in 1928. There is, of course, no way of telling whether this decrease has resulted from the elimination of necessary social calls, nor is there any way by which this department, the telephone company or the telechronometer interests can determine what calls are necessary and what are unnecessary. Calls that seem unnecessary and trivial to them might appear to be vital to the person making the call.

Numerous telephone users from Everett testified that the fear of high telephone bills had forced them to discontinue using the telephone, except for urgent and important matters. The enforced restriction was in the opinion of these witnesses deleterious to the social and economic life of the community. This restriction of the telephone might be defended if the financial condition of the company was thereby improved and lower rates made possible.

In point of fact, the condition of the company is less favorable than under the former flat rate. There has been an increase in operating expenses, both per station and per subscriber, and a decrease in revenues per station and per subscriber. Under flat rate in 1925, the telephone earned 7.65 per cent, in 1926, 7.34 per cent, and from April 1, 1927, to March 31, 1928, under telechronometer rates, 2.57 per cent.

The average number of subscribers in 1925 was 6,482; in 1926, 6,822; for the period April 1, 1927, to March 31, 1928, 7,892. The total exchange service revenues for the same periods were $266,888.74, $278,463.43, $285,736.36.

Payments with Telechrometers.

"From this it appears that under the telechronometer system a larger number of subscribers are paying a substantially larger sum, are making fewer telephone calls, are talking for shorter periods of time; and that the telephone company, instead of earning a larger return, is earning substantially less.

To this may be added the fact that after the 1926 order of the department, residence telephone subscribers in Everett were re-classified to the next lower grade of service—that is, those one-party lines were transferred to two-party lines; two-party to four-party; and four-party to ten-party—so at the present time telephone users in Everett are paying more money for less use of an inferior service.

The cause of the situation is not difficult to determine. The records show that the average cost of the telechronometers to the telephone company, including the rental charge, is $40,000 a year. Were this sum added to the net income for a period last named, the rate of return would have been over 6 per cent.

Telechronometer interests contend that the adoption of the telechronometer has postponed and will postpone for many years an additional investment of some $500,000. The department sees no basis in the record for this contention. The evidence indicates that the annual additions to the plant have been about the same under the telechronometer as before. Moreover, the savings from the use of the telechronometer can be realized only when the plant approaches saturation.

There is no practical way to remove from the plant the equipment not required because of the telechronometer, if such equipment actually exists, and at the present rate of growth 10 to 20 years will be required to realize the purported savings from the telechronometer.

The telephone plant at Everett in 1926 and at the present time is far from saturation. The record shows that the plant is capable of handling 11,000 patrons without any extraordinary outlay under the telechronometer system, and there is no reason to believe that the same number could not be handled under a flat rate operation.

The vice-president and superintendent of plant of the Puget Sound Telephone Co. testified that the additional investment required to return to flat rate would be between $10,000 and $20,000. The normal telechronometer expense of $40,000 a year, capitalized at 15 per cent would build facilities to care for 1,812 additional subscribers or 2,180 additional stations. At the present rate of growth, it will require nearly ten years to attach that number of additional subscribers.

Considerable point was made at the hearing of the speedy service in Everett which it is claimed is due to the telechronometer system. There is nothing in the record to support this claim. On the contrary, the record indicates that in an effort to speed up the service the telephone company employed additional operators.

Any slowness of the operators is very irritating to the public under telechronometer rates whereby the patron is charged for delay in the central office. The same desire to keep down the telephone bills has resulted in an increase in the uncompleted calls. If the called party does not answer at once, the calling party is inclined to hang up and thus stop the running of the meter.

Many other points are advanced in the record or in the briefs by the parties to the controversy but an examination of each would only prolong this discussion, already too long. The points discussed seem to the department to be those vital to a correct solution of the problem."

Fall Series of Oklahoma District Telephone Meetings Announced.

Places and dates for six district meetings of the telephone division of the Oklahoma Utilities Association, have been announced by W. O. Mills, Skiatook, chairman of the telephone division. These are: Garber, September 9; Waynoka, September 10; Thomas, September 12; Yale, November 17; Purcell, November 19, and Temple, November 21.

These meetings will be a continuation of the 1930 series of district telephone meetings which started last spring and which are to be held in every section of the state. Programs for the fall meetings are now being arranged.

Officers Elected at Convention of Washington Association.

At the 15th annual convention of the Independent Telephone Association of Washington held at Hood River, Ore., last month, D. M. Yost of the Edmonds Independent Telephone Co. of Edmonds, Wash., was elected president; J. W. Baker of Spokane, re-elected as secretary and treasurer. David Burr, of Kirkland, was elected vice-president.

The next convention will be held at Elma., Wash. The Independent Telephone Association of Oregon representatives were also in attendance.

A. T. & T. Co.'s Overseas Telephone Service Reaches Vatican.

Modern invention and venerable tradition were linked on Saturday, July 5, when the transatlantic telephone service of the American Telephone & Telegraph Co. was extended to the state of Vatican City, residence of the Pope. Thus the See of the vicars of the Roman Catholic Church was brought within voice range of a con-

(*Continued on page* 40)

THE BELL TELEPHONE SYSTEM IS ORGANIZED TO GIVE CONSTANTLY IMPROVED SERVICE . . . QUICK, ACCURATE, EASY TO USE

What you want of the telephone . . . it is our business to give

An Advertisement of the American Telephone and Telegraph Company

WHEN you order a telephone, you want it put in promptly. During the last five years the average length of time needed to have a telephone installed has been cut nearly in half.

You want quick and accurate service, free from trouble. Good as the service was five years ago, today there are a third less troubles per telephone. During this same period there have been marked increases in the already high percentage of perfectly transmitted conversations.

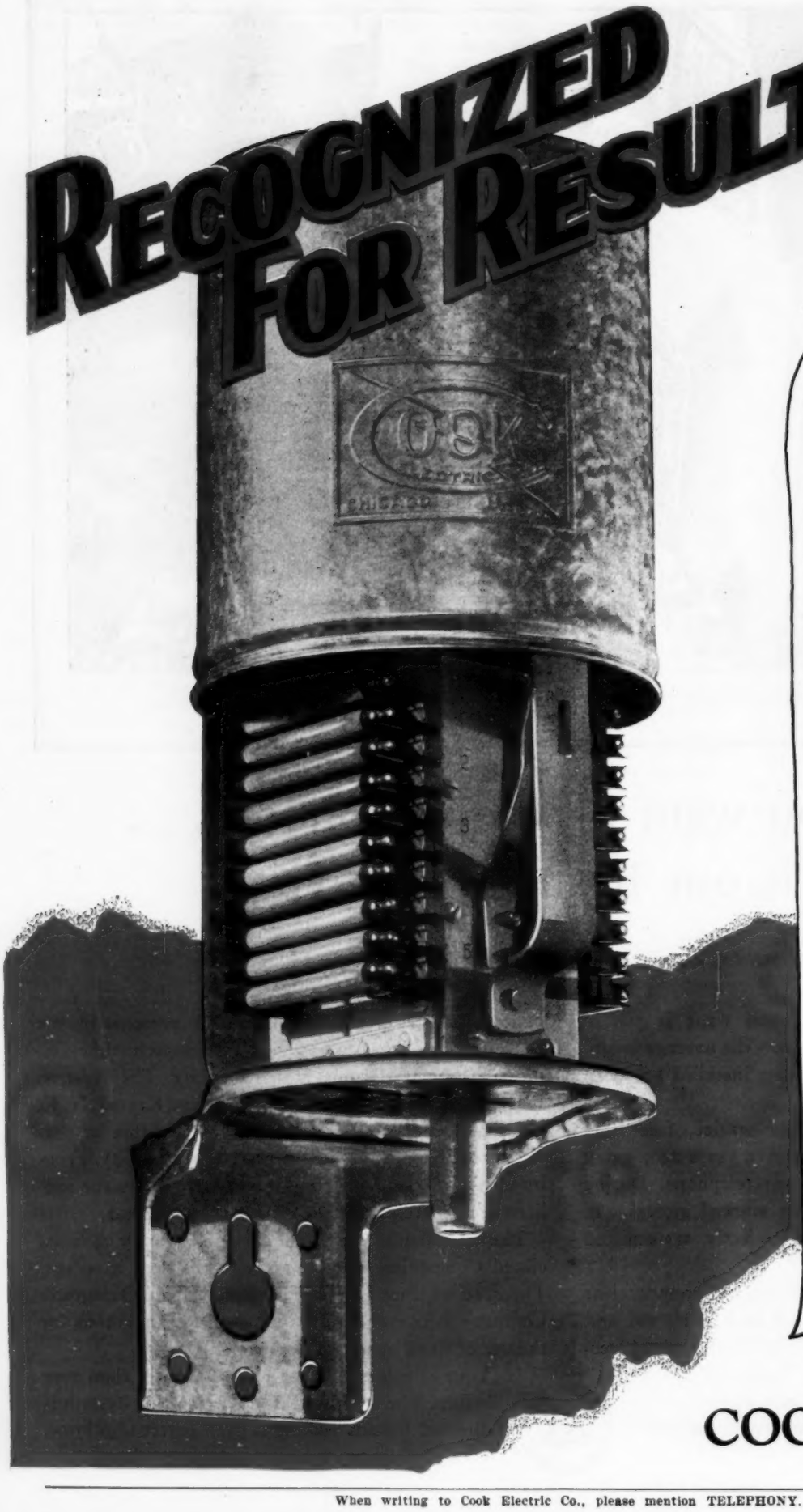
When you make a toll call, you want a prompt, clear connection. Five years ago 70 per cent of all toll and long distance calls were handled while the calling person remained at the telephone. Today all but a very small per cent are handled this way.

The Bell System is organized to give constantly improved service. Several thousand persons in the Bell Laboratories are engaged in research that improves the material means of telephony. The Western Electric Company, with plants at Chicago, Kearny, N. J., and Baltimore, specializes in the manufacture of precision telephone equipment of the highest quality. From its warehouses all over the country, it supplies the millions of delicate parts for Bell System apparatus.

The operation of the System is carried on by 24 Associated Companies, each attuned to the area it serves. The staff of the American Telephone and Telegraph Company is continually developing better methods for the use of these operating companies.

Your telephone service today is better than ever before. The organized effort of the Bell System is directed toward making it even better tomorrow.

RECOGNIZED FOR RESULTS



Twenty-five years ago this S-6 Protected Terminal was introduced to the telephone industry.

It has served its purpose so well that it has been adopted as standard on thousands of systems throughout the world.

It is recognized for the protection it affords and its lasting qualities.

It furnished an easy and perfect method for terminating cable and making drop connections.

The hood, core box and bracket are of Toncan Iron, hot galvanized. This material is high in rust resisting qualities and the hot galvanizing insures a life far in excess of the life of the cable.

Insulation is of hard rubber. Fuse and contact springs are of phosphor bronze.

Significant is the fact that nearly all of the S-6 terminals made during the last twenty-five years are still in active service, and this, too, under every conceivable atmospheric condition.

If you use protected terminals, the S-6 merits your consideration.

Ma

COOK ELECTRIC PA

When writing to Cook Electric Co., please mention TELEPHONY.

FROM EVERY ANGLE A 100% TERMINAL

This X-B Terminal offers you more, for less money, than any other terminal made. We invite you to compare it point by point with any unprotected terminal—design—material and workmanship.

Design reflects our thirty years in specializing in terminal building.

The core-box and bracket are of Toncan Iron, hot galvanized.

THE FACE PLATE AND FANNING STRIPS ARE MOULDED IN ONE PIECE OF BAKELITE.

The studs are 10/32 red brass set in grooves in the Bakelite.

The hood is of heavy zinc.

The cable is permanently soldered to the box and protected against vibration by a metal strap.

THIS TERMINAL CAN BE MOUNTED WITH CABLE FROM TOP OR BOTTOM BY SIMPLY REVERSING THE HOOD.

There is ample room for drops.

Could you ask for more in an unprotected terminal?

You are invited to send for this remarkable terminal and inspect it.

The prices are low.

PANY, *2700 Southport Avenue* CHICAGO

(*Continued from page 36*)
tinent that was a wilderness when Rome was the center of a great civilization.

Within walls centuries old, the Vatican has an automatic telephone system of the latest design, equipped with about 500 lines and with a capacity of 1,800 stations. Service to the outside world is provided by about 30 circuits through a partly automatic switchboard.

The chain of communication between Vatican City and America is composed of a series of radio, land wire and submarine cable links totaling more than 4,700 miles. This is a further extension of America's overseas connections in Italy, service being already available to all of Northern Italy and to the city of Rome.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Questions Indiana Commission and Company in Terre Haute Case.

Judge Charles H. Bedwell, of Sullivan, Ind., chosen to hear the case of the city of Terre Haute against the Indiana Public Service Commission, a suit in which it is sought to have set aside the order of the commission raising telephone rates in Vigo county, on July 11 received interrogatories and an amended motion of the city.

He ordered the interrogatories answered by the commission and the telephone company on the first day of the September term of court. The motion was taken under consideration until that time, the defendants to file answer on or before September 1.

The interrogatories were filed by Attorneys Henry Moore and Charles C. Whitlock on behalf of James E. Milks, John M. Masselink and the Honey Creek Mutual Telephone Co., co-defendants. One set was for answering by the commission and one by the telephone company.

The commission is asked to tell:

1. The separate items of real estate considered as property of the Citizens' Independent Telephone Co. in the order of December 20, 1929, raising the telephone rate.
2. All other assets considered.
3. Officers and salaries of telephone company.
4. The basis on which depreciation was figured.
5. Work in progress for which the sum of $22,766 was allowed.
6. The allowances for "good will" and "going concern."
7. Annual expenditures.

Interrogatories which the Citizens' Telephone Co. must answer are:

1. Legitimate expenditures for the years of 1926, 1927, 1928 and 1929.
2. Book valuation of property.
3. Depreciation of property yearly.
4. Amount expended for newspaper advertising.
5. Amount paid for legal services in year of 1926, 1927, 1928 and 1928.

The other motion, which was of an amended nature and filed by the attorneys for the city, consists of three parts. The first asks a judgment on the face of the evidence thus far submitted, reducing the rates to their former level. The second, to be ruled upon in case the first is rejected, asks that a temporary injunction be declared reducing the rates until a permament decision is reached.

The third asks that the additional funds resulting from the higher rates be set aside for possible refunding by the telephone company until the case reached its conclusion.

Chicago Bell Franchise Recommended to City Council.

Members of the Chicago city council committee on gas, oil, and electric light, on July 21 voted unanimously to recommend the adoption of the amended telephone franchise bill at the city council meeting July 29.

The ordinance grants a 23-year franchise to the Illinois Bell Telephone Co.. It provides that the company shall pay to the city 3 per cent of its gross revenues from all sources, including long distance calls, and guarantees the city a minimum payment of $2,000,000 annually.

It further provides that the company shall pay the city $3,000,000 within 24 hours after passage of the ordinance, this sum representing 3 per cent of the gross profits accruing since January 15, 1929, when the old franchise expired.

A section of the franchise provides that the agreement shall be terminated in the event that the Illinois Commerce Commission or the courts hold, in any litigation that may come before them, that the $2,000,000 payment shall not be made.

No attempt is made to fix rates, but a section of the franchise provides that, in the event Chicago is ever granted home rule, the company will accept rates made by the city council.

Ald. A. J. Horan on July 21 indicated that he would have some amendments to present, but it is understood that he will defer their presentation until he can do so on the floor of the council. He declined to detail their nature.

Ald. William D. Meyering, one of the dissenters when the unamended draft of the measure was before the committee last week, made the motion which sent it to the whole council.

Previously he urged more time for consideration, but he has now been convinced, he said, that the franchise makes it mandatory that the Illinois Bell Telephone Co. pay the cost of relocating its conduits and cables for the subway and to pay a reasonable rental for occupancy of subway space. Amendments tacked to the franchise by the committee on July 15 satisfied him on the doubtful points, he said.

The franchise provides that if any ordinance shall be adopted by the city council authorizing or empowering the city to require public utilities to remove and relocate their conduit, cables, and other equipment, the company agrees that it will accept the ordinance and will remove and relocate its equipment in conformity with it.

An amendment was adopted which made the responsibility of the telephone company for the removal of equipment more certain, according to the aldermen, and safeguarded the rights of the city to demand such removals under other legislation and agreements.

Another amendment provides: "The company agrees that it will pay the city a reasonable rental for any space occupied and used by the company in any subway or subway structure or in any gallery or galleries connected therewith."

Indiana Denies Increase to North Manchester Company.

A petition of the Northern Indiana Telephone Co., of North Manchester, Ind., to increase rates and to establish free service between certain exchanges has been denied by the Indiana Public Service Commission.

The towns involved were North Manchester, Akron, Bourbon, Mentone, Atwood, Bippus, Burket, Claypool, Etna, Green, Fulton, Macy, Sidney, Silver Lake and Millwood. The rate increases proposed ranged from 25 to 75 cents.

Hearing on the petition of the company for increased rates was held at North Manchester last February and the case has been under advisement ever since. During the time the commission was considering the case, the chairman of the commission went to North Manchester and other towns affected by it to talk the matter over with patrons and attempt to get the patrons to reach a compromise with the telephone company so that the commission might ap-

How to tie up service . . . *wholesale!*

. . . It doesn't take much defective telephone cable to tie up a whole system . . . silence the busiest lines . . . win the wholesale ill-will of subscribers . . . To maintain "unbroken service," the watchword of the telephone industry, it pays to use the finest cable obtainable. It more than pays to install Western Electric Lead Covered Cable . . . not the cheapest cable, but the most economical in the long run . . . Why is Western Electric better? The answer is easy . . . Experience since the earliest days . . . largest and best manufacturing facilities . . . selected quality materials . . . careful testing and re-testing . . . and all the tradition for quality implied by the name, Western Electric.

Graybar

OFFICES IN 76 PRINCIPAL CITIES. EXECUTIVE OFFICES: GRAYBAR BLDG., NEW YORK, N. Y.

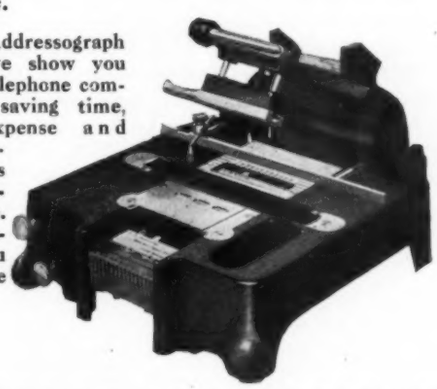
Suppose a business man said "I don't need a telephone!"

No business man who knows the advantages of a telephone would say this. Likewise, no telephone man who knows Addressograph advantages would say that he doesn't need an Addressograph.

84 of the 114 largest independently owned operating telephone companies, as well as thousands of smaller companies, use Addressographs to reduce expense, save time, prevent mistakes and add to profits.

There are Addressograph machines as low as $20, f. o. b. Chicago, and same machine imprints subscribers' bills with name, address, date, rate, etc., and writes and imprints countless forms used in office, stockroom, shop, etc. The work is done 10 to 50 times faster than by hand methods and errors are impossible.

Let the Addressograph representative show you how other telephone companies are saving time, reducing expense and eliminating errors with Addressographs. Send the coupon. You will not be obligated.



ADDRESSOGRAPH COMPANY

General Offices: 901 W. Van Buren Street, Chicago, U. S. A.
Canadian General Offices: Addressograph Co., Ltd., 30 Front Street W., Toronto, Ontario.
European General Offices: Addressograph, Ltd., London, England.
Divisions of Addressograph International Corporation.
Factories: Chicago, Toronto, London, Berlin.
Sales and service agencies in the principal cities of the world.

Addressograph
TRADE MARK
PRINTS FROM TYPE

Addressograph Co., 901 W. Van Buren St., Chicago, U. S. A.

Am interested in knowing how Addressograph will reduce expense and save time in my business.

Name.....

Address.....

prove the compromise instead of ruling on the petition.

Patrons of the company, however, refused to work for a compromise contending that such action had previously been taken and that they were the ones who lost by it.

When the hearing was held, it was shown that following the increase in rates in July, 1929, the company lost more than 1,000 subscribers in less than six months.

Patrons pointed out that had the old rates remained, the subscribers would also have remained and the company would have been able to show a profit on the low rate instead of a loss on the higher rate. It was said at the same time that in event rates were again increased, the company would face a further loss of subscribers and an additional loss in revenue instead of a gain as anticipated.

Minnesota Company Authorized to Increase Switching Rates.

The Middle River Telephone Co., of Middle River, Minn., has been granted permission by the Minnesota Railroad & Warehouse Commission to increase its rates.

The Middle River company operates a magneto exchange at Middle River, serving approximately 49 town and rural stations, and performing a switching service for 116 rural connecting company stations. It also owns and operates a toll line between Middle River and Gatzke, a distance of approximately 18 miles.

The Middle River company has been authorized to place the new rates into effect August 1. The company proposed 50 cents per month for rural switching charge, but an objection was entered against this particular charge The commission's decision allowed a rural switching charge of 35 cents per month, or $4.29 per year.

The old and new net monthly rates are:

	Old	New
Individual line business	$2.00	$2.75*
Individual line residence	1.25	1.75*
Rural multi-party	.50	1.75*
Extension stations, bus. or res.		.50
Extension bells		.25
Rural switching charge	.21	.35

* All gross rates, payable quarterly with a discount of 75 cents if paid during the first month of the quarter for which bill is rendered; a discount of 50 cents if paid during the second month of the quarter; and a discount of 25 cents if paid during the third month of the quarter.

Standard service connection charges were also authorized by the commission.

Ohio Commission Approves Rate Schedule, Effective July, 1928.

The Ohio Public Utilities Commission has approved the advanced telephone rates to be charged by the Buckeye Lake Home Telephone Co., which serves Baltimore, Millersport, Pleasantville, Thurston, Thornport and Buckeye Lake.

The schedule became effective July 16, 1928, and has been collected since that date, a bond being put up to cover any refunds ordered. Subscribers filed a protest against the tentative value on the plant appraised for rate-making purposes. The commission held that the new rates were equitable and permitted the company to continue them.

I. C. C. Approves Stock Control Transfer in Virginia.

The Chesapeake & Potomac Telephone Co. of Virginia has received approval from the Interstate Commerce Commission to acquire control of the Petersburg Telephone Co., of Petersburg, Va., by purchase of capital stock and a certificate has been issued to that effect.

The Petersburg company owns and operates exchanges at Petersburg, Hopewell, and Chester, Va., which serve a total of 6,154 subscriber stations, and 52 pole miles of toll lines.

The outstanding capital stock of the Petersburg company consists of 2,937 shares of par value of $100 each, 978 shares being owned by the Chesapeake & Potomac company. On December 21, 1929, the Chesapeake & Potomac company entered into a contract with seven individual stockholders to purchase their stock, aggregating 581 shares, at $400 a share. The company proposes to purchase all remaining stock at the same price within 90 days of the issuance of the certificate by the Interstate Commerce Commission, and has agreed to notify all minority stockholders of its offer.

An appraisal made by the Chesapeake & Potomac company's chief engineer finds the reproduction cost of the properties of the Petersburg company to be $931,561, and less depreciation, $797,382. The Petersburg company also owns about 59 per cent of the outstanding capital stock of the Dinwiddie Telephone Co., of DeWitt, Va., and all of that company's outstanding bonds, of a par value of $14,500. The estimated reproduction cost of the Dinwiddie company's properties is $55,984, and less depreciation, $35,981.

The Dinwiddie company owns and operates an exchange at DeWitt, Va., which serves 204 subscriber stations, and has always been considered a part of the Petersburg company's operations. In 1929, operating revenues and operating expenses of the Petersburg company were $267,938.82 and $180,430, respectively.

Upon the assumption that the Chesapeake & Potomac company will be able to acquire all the remaining stock at $400 a share, the total cost of all the stock of the Petersburg company, including that which it now owns, would be $871,620.

For many years there has been competition of service in the territory of Petersburg, which was finally eliminated by the organization of the Petersburg company. The Southern Bell Telephone & Telegraph Co., received about one-third of the stock for properties which it conveyed to the Petersburg company, and since that transaction, the Southern Bell and the Petersburg companies have been working together. Some of the circuits of the Bell company's main toll cable route, connecting northern and southern points along the eastern coast, pass through the central office of the Petersburg company. The Bell company placed a large plant for toll service in the territory served by the Petersburg company, and some plant items are owned by the two companies jointly.

The existing situation creates a divided responsibility for furnishing service which will be removed by the Chesapeake & Potomac company acquiring full control of operations.

The principal cities served by the Petersburgh company are Petersburg, an important manufacturing point with a population of about 39,000, and Hopewell, whose population has increased from 1,397 in 1920, to about 12,000. The value of plant additions under construction at Hopewell is approximately $20,000,000, and the industrial development aggregates about $55,000,000.

The Petersburg company has expended $90,000 in rehabilitating its Hopewell plant, but further large expenditures are necessary to meet the increased demand, which has influenced the stockholders to dispose of their stock. The Chesapeake & Potomac company does not propose to make any change in the operation of the Petersburg company.

At the hearing, communications from the mayor of Petersburg, the city managers of Petersburg and Hopewell, and other telephone users were introduced in evidence, all favoring the proposed acquisition.

Commissioner Eastman dissented, stating that he was not satisfied that a purchase price, as high as $400 per share for the stock of the company, was justified.

Wisconsin Company Authorized to Inaugurate Classified Rates.

The Pine Lake Rural Telephone Co., of Rhinelander, has been granted authority by the Wisconsin Railroad Commission to increase its rates for service on its lines that connect with the Rhinelander Telephone Co., of Rhinelander.

On December 31, 1929, the Pine Lake company was serving 37 subscribers over four metallic lines connected to the Rhinelander company's exchange. The cost of the property at that time was reported to be $3,900. The Pine Lake company owns 31 miles of pole line.

The cash receipts for 1929 were approximately $921, and the expenditures were $695, leaving $226 for deprecition and return. The Pine Lake company states that the Rhinelander Country Club and some other business places want private line ser-

(*Turn to page* 51, *please*)

Made From Ohio River Fire Clay
Ohio River Fire Clay has long been recognized as superior for products where strength, and long life are required.
VITRICLAY conduits are the only duct made from this famous clay.
VITRICLAY
TORONTO
KAUL
OHIO
PRODUCTS
1. Smoot duct
2. Uniformly glazed
3. Properly vitrified
4. Finished with exactness and
"Straight as an arrow"
THE KAUL CLAY MANUFACTURING CO.
TORONTO, OHIO.

Crapo
GALVANIZED PRODUCTS
Telephone and Telegraph Wire
Extra Best Best (EBB)
Best Best (BB)
Steel
Seven Wire Steel Strand
Standard
Siemens-Martin
High Strength
Extra High Strength
Crapo Galvanized Products combine every element essential to long life and low maintenance cost: pure zinc coatings, non-cracking, non-peeling—correct tensile values—proper ductility.
Immediate shipping service from Distributors' stocks in all jobbing centers.
Manufactured Exclusively by
Indiana Steel & Wire Co.
Muncie, Indiana
INDIANA STEEL & WIRE CO.
Crapo
Galvanizing
MUNCIE, IND.
INDIANA STEEL & WIRE CO.
MUNCIE, IND.

TELERING
For Central Office and PBX Ringing
IN USE ALL OVER THE WORLD
ONE REED!
ONE CONTACT!
IDEAL WAVE FORM
REDUCE YOUR RINGING COST
ORDER ONE ON TRIAL
TELERING
More power than you need.
IT PAYS FOR ITSELF
Converts 60 Cycle Lighting Current to 20 Cycle Ringing Current
POSITIVELY NO RADIO INTERFERENCE
Very low current consumption.
Price $44.00 — F. O. B. Elyria
Fully Guaranteed.
Sold by Leading Telephone Distributors
TELKOR, INC., ELYRIA, OHIO
(Write for booklet)

Lanesboro, Minn., Again Steps Ahead

Farmers & Merchants Telephone Co., Operating in Rich Farming and Dairying Community, Has High Development Ratio as Result of Progressive Management—Description of the Building Erected and New Central Office Equipment

By G. O. Wilson,
Sales Representative, American Electric Co., Inc.

In determining the relative economic wealth and status of a community, statisticians have always placed great emphasis on the number of telephones per hundred inhabitants. Even if all other indications were discounted entirely, the fact that nearly every residence and place of business in Lanesboro, Minn., has a telephone would accurately portray the enterprising spirit of this community.

The town of Lanesboro is located in the southeastern portion of the state, about 15 miles from the northern boundary line of Iowa, on the Chicago, Minneapolis, St. Paul & Pacific R. R. It is in the center of rich farming and dairying country—a section which is locally known as "The Heart of Fillmore County." The 1930 census gave Lanesboro a total of 1,015 people.

The Farmers & Merchants Telephone Co., of Lanesboro, has 285 local stations and 290 connecting company stations. No mushroom growth has been experienced in building this high ratio of development—but slowly and surely the use of the telephone has become more and more appreciated by the citizens of Lanesboro. Consequently, today they can boast of a first-class telephone service.

Major credit, however, for this high ratio of telephone development rightfully belongs to the progressive management of the Farmers & Merchants Telephone Co. The recent installation of completely new and modern central office equipment is indicative of the constant improvement policy of this organization—a policy which places Lanesboro near the top of any list of highly-developed telephone properties.

O. W. Hanson, General Manager of the Farmers & Merchants Telephone Co. at Lanesboro, Minn.

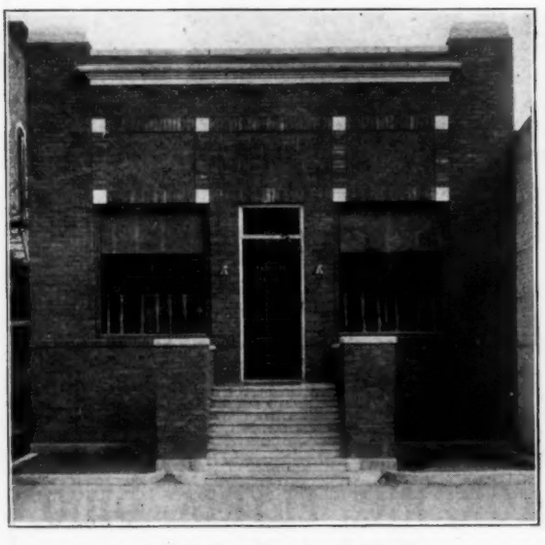
When the installation of the new exchange equipment was first planned, it was decided that a new building would be required to house it. O. W. Hanson, general manager of the company, in collaboration with a local architect, planned the building in accordance with the requirements. As a result, the new structure might well be taken as a model for exchanges of this size.

The building is of brick construction with full fireproof interior. The entrance, which is in the center of the building, leads into a hallway which extends the full length of the building. The first door on the left, as you enter, leads into the switchboard room. Back of the switchboard room and connected to it, is the operators' restroom furnished with modern comfortable furniture and attractively decorated.

Across the hall from the switchboard room and on the right as one enters the building is the secretary's office. A wicket window is provided into the hall so that business may be constructed without having patrons enter the secretary's office. Back of his office is the power room in which is installed the relay rack, the protective equipment, the ringing apparatus and a wire chief's test turret. The batteries are located in a specially-designed compartment in the basement.

In the selection of the new switching apparatus, careful consideration was given to all available types. The requirements were to provide the finest possible central battery service to local subscribers and to give as nearly as possible the same type of service in switching calls on the rural magneto lines,—and to do all this at the lowest possible cost. After full investigation, the company officials decided upon American Electric monotype equipment as best meeting the requirements.

The new switchboard is a two-position



New Exchange Building at Lanesboro, Minn.—View of Operating Room and New American Electric Switchboard.

Generators

Magnets recharged, worn gears replaced, armatures rewound, and contacts polished. Magnets and plates refinished. Thoroughly checked and tested for voltage.

Kellogg—

No. 15, 3-bar.....$2.50
No. 22, 4-bar.....$4.50

Western Electric—

No. 22A, 3-bar.....$2.50
No. 48A, 5-bar.....$6.00

Stromberg-Carlson—

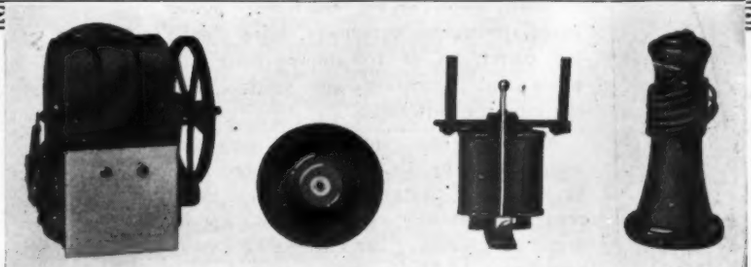
No. 53, 3-bar.....$2.50
No. 42, 4-bar.....$4.00
No. 38, 5-bar.....$5.00

Transmitters

(Nickel or Black Enamel)

New Carbons, new rubbers, thoroughly checked and tested. Stromberg-Carlson, Kellogg, Western Electric, American, Leich or Dean, less backs, each $1.00

Backs for any of the above, each ..... .25



Suttle Rebuilt Parts

These parts are completely overhauled and rebuilt and are guaranteed to give service equal to that of new equipment. They are cleaned up and refinished so they look like new. See our general catalog for complete list of rebuilt parts.

Receivers

Kellogg, W. E. or S. C. equipped with new shells, cords and caps $1.50

American, new shells and cords, special at .75

Stromberg-Carlson, metal type, each... .75

Ringers

Straight Line Ringers—Kellogg, W. E., S. C., Dean and other makes; 1000, 1600 or 2500 ohms, each $1.50

Harmonic Ringers—Kellogg, S. C., Dean, any frequency, each $1.75

Vibrators or Armatures—Straight line ringer type, each .....$ .60

Harmonic ringer type, each .....$ 75

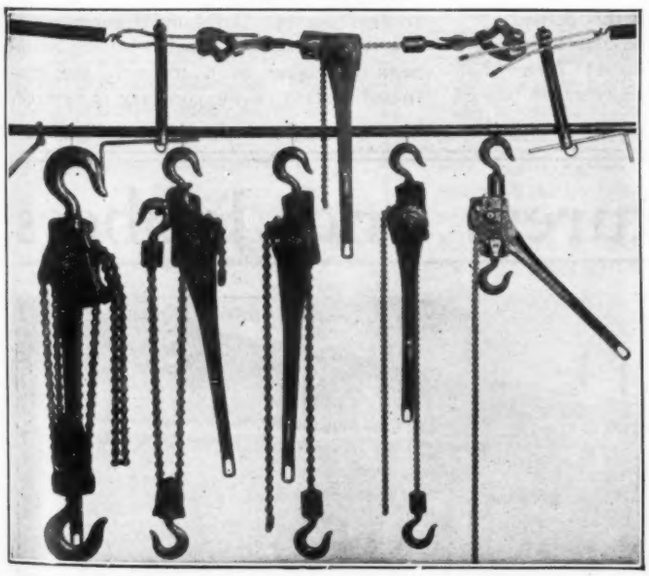
Suttle Equipment Co.

FACTORY AND MAIN OFFICE
Lawrenceville, Illinois

Coffing Hoist and Guy Clamp

The Lineman's Friends

FAMILY GROUP



Model C. Ton Weigh 65 lb.	Model F. S. 3 Ton Weight 36 lbs.	Model F. 1½ Ton Weight 25 lbs.	Model A ¾ Ton Weight 13 lbs.	Model A Reversed

Hoists can be used either end up or in any position.

A truly one-man tool, light, fast, powerful, simple, durable.

Models A and F particularly adapted to utility work, pulling guys, messenger wires, underground cables, poles, lifting transformers, loading heavy supplies, booming poles. Also have a pole jack for pulling and straightening poles. Pole clamp for changing top cross arms on corners and in pole lines. Will send on 30 days' trial.

COFFING HOIST COMPANY

317 East Vanbren Street DANVILLE, ILLINOIS

LEICH

Nos. 221-A and 222-A

Combined Charging and Ringing Converters

Ideal power plant for Private Branch Exchanges of 300 stations or less.

These converters are designed to charge a 24-volt storage battery at a 1, 1½, or 2 ampere rate which is ample to keep the battery fully charged.

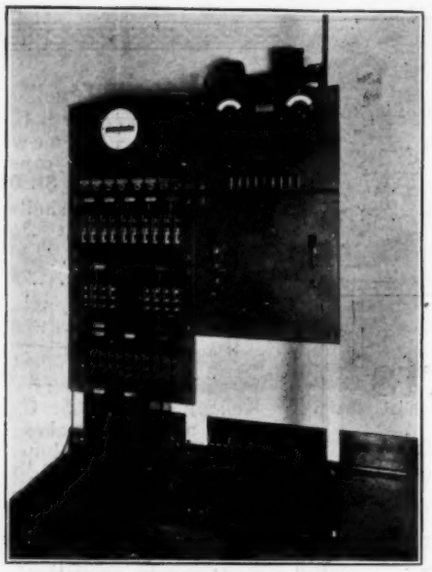
Complete power for a PBX switchboard, telephones and ringing—No other battery required.

Economical—quiet in operation—free from radio interference.

Liberal allowance offered for old ringing equipment.

LEICH ELECTRIC CO.

Genoa, Illinois



Power Board Furnished by American Electric Co., Inc., for Farmers & Merchants Telephone Co. at Lanesboro, Minn.

monotype junior switchboard with 320 common battery lines and 40 magneto lines. The cord circuits are of the feature universal type permitting the operator to connect a common battery or magneto line to a common battery or magneto line without discrimination and to retain all features when connecting one common battery line to another. A distinctive feature of this board is that all cord circuit relays are mounted on the outside rack.

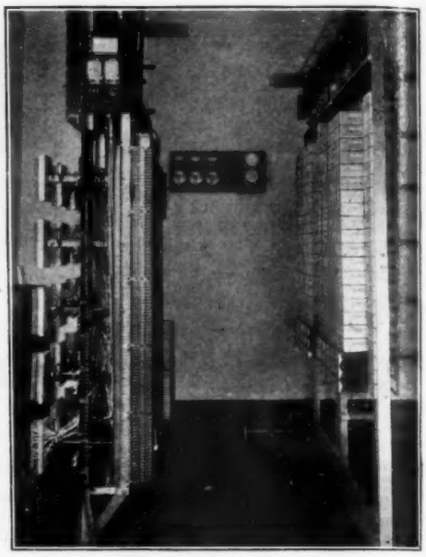
This installation also marked the first use of the new American Electric combination main distributing frame and line relay rack. In this new design, the line relays are mounted on the top of the frame, out of the way, yet easily accessible when necessary. Auxiliary equipment installed included two ringing machines, power board, protective equipment, wire chief's test turret, set of 160-ampere hour batteries and a mercury-arc rectifier for charging the batteries.

All of the new central office equipment was installed by Mr. Hanson assisted only by local help. After everything was made ready, the cut-over took place with appropriate ceremonies. The citizens of Lanesboro were highly complimentary in expressing their appreciation to the telephone company's officials and especially to Mr. Hanson.

Mr. Hanson has been with Farmers & Merchants Telephone Co. for the past 12 years. During this time he supervised the complete rebuilding of the company's exterior wiring so that today, it is as fine an outside plant as could be desired. Even though the company's territory is widely spread out, virtually all of the distribution is cable, with a few open-wire leads. The installation of the new exchange equipment brings Mr. Hanson's plan of improvement to completion.

The spirt of cooperation has always been strong among the people of Lanesboro. The community building costing about $40,000, seats 1,100 people. The electric light and power plant is municipally-owned, and furnishes light and power to the citizens at rates which are as low, if not lower, than anywhere else in the state. Correspondingly, the telephone company has always operated as economically as is consistent with good telephone practice, to give the best possible service at the lowest cost. The history of the company bears out the wisdom of this policy.

The Farmers & Merchants company was first incorporated in 1911. Twenty-two members of the community constitute its directorate—five of whom are actively engaged in supervision of its affairs.



New Combination Main Distributing Frame and Line Relay Rack Built for Lanesboro by American Electric Co., Inc.

The company at the time of its incorporation was capitalized at $4,500, and this has never been changed. The entire cost of rebuilding the outside plant and even a good portion of the cost of the new exchange has been paid for out of accrued earnings upon deposit. The present book value of the company was recently established at $26,660.

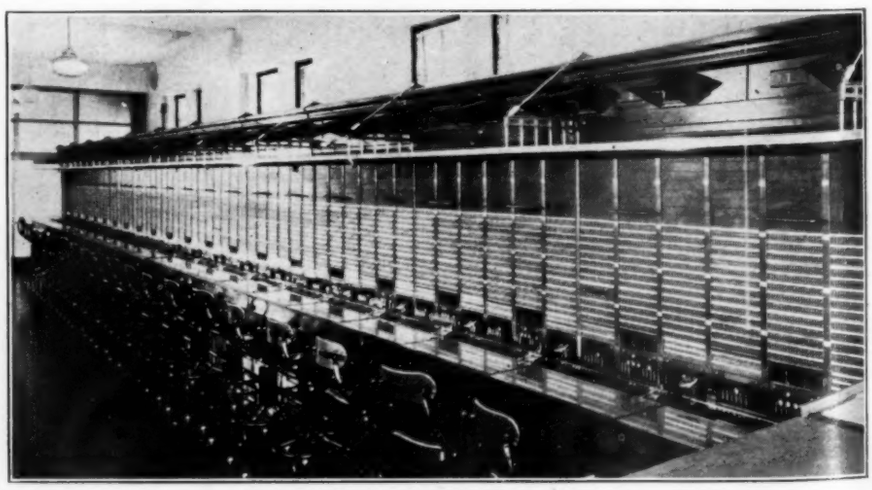
The excellent success of the company can be largely attributed to its extreme carefulness in keeping step with its subscribers' wants. If the many compliments concerning the new common battery equipment are taken as a criterion, the continued success of the company is assured.

With the Manufacturers and Jobbers

Do/More Operators' Chairs in Large Long Distance Office.

What is said to be the third largest long distance office in the world was placed in service June 1, in Detroit, Mich. The test and control board having 22 positions is equipped with Do/More correct posture chairs of the high-base, ring-footrest, swivel type, having the plain spindle and wedge height adjustment feature.

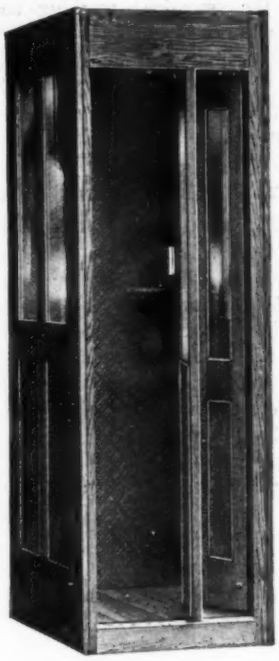
This switchboard installation was made by the American Telephone & Telegraph Co. at a cost said to be $3,000,000.



View of A. T. & T. Co.'s Long Distance Switchboard in its Detroit Exchange, Which is Equipped With Do/More Operators' Chairs.

Two New Kellogg Switchboards for Texas Railroad.

That the Texas South-Eastern Railroad Co.'s business must be good is somewhat indicated in the fact that it has recently placed an order with the Kellogg Switch-



Churchill booths are profitably serving telephone companies of every size, in every part of the country.

They also can be forceful, silent salesmen for you.

Placed in strategic locations they invite patrons because of their attractiveness. They are well designed — comfortable and roomy.

You can substantially increase your company's revenue by installing these booths which are a product of the Churchill Cabinet Company, a concern with 25 years' experience in making fine cabinets.

Manufactured in Chicago, Ill. at 2119 Churchill Street

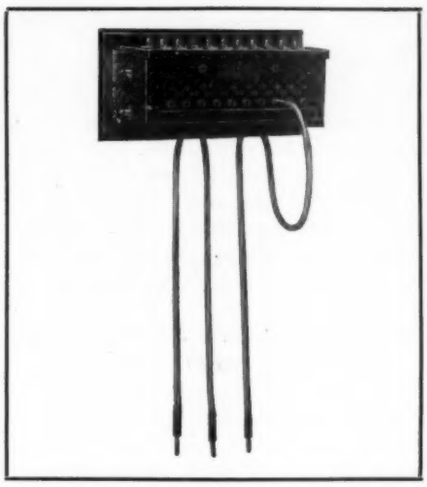
Distributed Nationally by

J. H. Bunnell & Co., Inc.
215 Fulton St.
New York City

board & Supply Co., of Chicago, for two No. 9-B magneto wall type switchboards. This type of switchboard can be operated with any standard magneto telephone. It consists of a compact cabinet, wired and equipped with ten-line circuits of the combined drop and jack type.

The line wiring terminates in binding posts on top of the cabinet to which may be fastened the outside lines. The top of the cabinet is also equipped with an air-gap lightning arrester. Two complete connections can be made at one time, and the operator can listen-in on either without breaking the connection.

This little switchboard, as shown in the illustration, is said to be a favorite among railways, as well as gas, electric, power



Kellogg No. 9-B Magneto Wall Type Switchboard Installed by the Texas South-Eastern Railroad Co.

and other companies operating a limited number of long lines, to connect for intercommunicating purposes.

As a special feature that can be added to this Kellogg magneto switchboard is the code night alarm. The drops can be equipped with code night-alarm contacts, which arrangement causes the night-alarm bell to give a signal to correspond with the code rings on the line.

These two new Kellogg switchboards are playing an important part in the every-day business of the Texas South-Eastern Railroad Co.

New High Rate Charger by Fansteel Products Co.

For charging 8 to 48-volt batteries at rates up to three amperes, the type CM charger, manufactured by the Fansteel Products Co., Inc., North Chicago, Ill., when operated on continuous or "trickle" charge, is said to be the equivalent of a 10-ampere rectifier or motor generator used in cycle charging.

A larger model, the Type CR, will deliver a charge up to six amperes, and will "float" a battery which ordinarily would require a 20-ampere input on cycle charge.

These chargers, consisting of trans-

$\pi r^2 a$

THERE is a considerable difference between the thickness of the insulator in an ordinary Battery and the D-W Patented paper-thin insulator in a Storm King.

Multiplied by the height, this Storm King Construction saves enough space to admit a generous extra amount of active material that is useful in making extra hours of performance. The thin insulator also reduces the internal resistance, retains its moisture and hastens recuperation.

For longer life and fewer replacements hook Storm King Telephone Batteries in your lines.

GENERAL DRY BATTERIES
INCORPORATED
CLEVELAND, O.

Makers of all types of dependable Dry Batteries for Radio, Ignition, Flashlight and General Use.

former, rectifier units, resistance units for output regulation, and filter circuit, are especially designed for telephone service under conditions of continuous use.

Charging rates are adjustable by means of transformer taps and resistance from

Fansteel High Rate Battery Charger for Telephone Use.

nearly zero up to three amperes in the type CM and six amperes in the type CR. When batteries have been heavily drained or completely discharged, the charger may be "boosted" far beyond the normal charging rates for any reasonable length of time without injury. Like all other Fansteel chargers, the rectifier cells cannot be injured by overload, nor is it possible for a battery to discharge through the rectifier.

A filter circuit, employing the newly-developed Fansteel tantalum condenser, is declared to entirely eliminate charging noise, making it possible to charge batteries while they operate, thus making duplicate batteries unnecessary. The filter circuit may be omitted when the charger is used for other purposes.

Although normally built for 115-volt, 60-cycle primary, transformers for 230-volt primary are furnished at no extra cost. Other voltages or frequencies may be provided on special order.

The rectifying elements are in plain view and operation is visible at a glance. Every necessary facility for operation is provided, including both primary and output fuses, double-pole indicating primary switch, and an accurate ammeter.

These Fansteel chargers are distributed by the Kellogg Switchboard & Supply Co., Chicago.

Several Oklahoma Properties Sold to Western Corporation.

The properties of the United Telephone Corp., with headquarters at Watonga, Okla., have been sold to the Western Telephone Corp., according to L. W. Scherer, organizer and president of the United Telephone Corp. The sale became effective July 1. It included exchanges at Watonga, Greenfield, Thomas, Canton, Custer City, Fay, Longdale, Seiling and Eagle City.

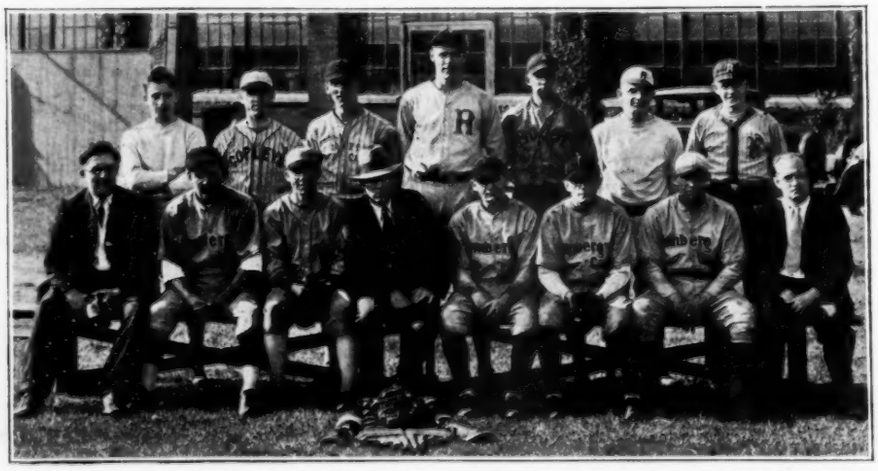
The Western Telephone Corp. has headquarters at Salina, Kans., and owns telephone and other utility properties in Oklahoma, Kansas and other states. The United Telephone Corp. was formed a little over two years ago when the Watonga Telephone Co. was purchased by Mr. Scherer. Thousands of dollars have been spent by Mr. Scherer in improving the system.

Stromberg-Carlson Factory Has Strong Baseball Team.

With seven victories and one defeat on its record, the Stromberg-Carlson baseball team is repeating the excellent showing it made last year when it was considered the best industrial team in Rochester, N. Y.

This year the telephone men have beaten some of the best industrial and semi-pro teams in Rochester. The last team they trounced was the Hart Stores nine, coached and managed by "Wicky" McAvoy, who was one of the best catchers in the major leagues when he played with the Philadelphia Americans.

The Stromberg-Carlson team is coached by Herb Kieso, who several years ago made a name for himself when he pitched for some of the best semi-pro teams in the East. Kieso has been working his men hard all season, with the result that he has one of the smoothest working combinations in western New York. Frank Walsh, formerly catcher for the Baltimore Orioles of the International League, is captain of the team and R. L. Luker is business manager.



Baseball Team of Stromberg-Carlson Which Is Making a Record in Games with Other Industrial Teams in Rochester, N. Y.

Californian Telephones Aviator Flying Above Buenos Aires.

F. T. Gray ,editor of the San Francisco Examiner, on July 21 telephoned to Capt. Lewis A. Yancey while the aviator was flying high above the airport in Buenos Aires, 7,825 miles away, and carried on a conversation successfully. The Buenos Aires operator who received the San Francisco call was greatly surprised, but quickly connected the Californian with the plane. Capt. Yancey later talked to Hollywood.

It required 23 minutes to complete connections. Six minutes were consumed in conversation. Throughout the entire conversation both parties could hear perfectly.

Time Service Available to Subscribers in New York State.

Beginning August 1, telephone subscribers of the New York Telephone Co. throughout New York state will be able, as New Yorkers have been since August 15, 1928, to get a correct answer to the question, "What time is it?" by telephone at a cost of 5 cents.

Persons in Westchester and Long Island may get the time by calling Meridian 1212, and those in the rest of the state may learn it by calling "Time Bureau." Pamphlets explaining the service, which entails a fixed charge of 5 cents from flat-rate subscribers and from coin-box and public telephone users and a charge for one local call from message rate subscribers have been mailed to subscribers. The charge, the company said, covers the cost of the service.

Overseas Telephone Service Now Extended to Reach Lithuania.

Another Baltic state was made accessible to the United States by telephone on July 16, when Lithuania was added to the European nations connected with North America by the overseas service, arrangements having been completed by the American Telephone & Telegraph Co. to extend the transatlantic talking zone to include the cities of Memel and Kovno.

Memel is the seaport of Lithuania and Kovno its temporary capital. They have a combined population of about 250,000, with some 9,000 telephones.

Prices in the Metal Markets.

New York, July 21: Copper—Unsettled; electrolytic, spot and future, 11c. Lead—Quiet; spot, New York, 5.25c; East St. Louis, 5.15c. Zinc—Steadier; East St. Louis, spot and future, 4.20@4.35c. Antimony—6.87c. Quicksilver—$119.00.

The Portable Ohmmeter.

General.

There are two methods of locating "bugs" in telephone plant: By a prolonged trial and error process; and by a systematic check, by means of "electrical testing equipment," of the various items that might be at fault.

This data sheet describes a testing device which can be easily assembled and wired by anyone who can handle a screw-driver and a pair of pliers, and it will prove itself a most useful piece of equipment.

The device is an "ohmmeter," or "continuity tester" as it is sometimes called. It enables testing lines, coils, telephones, etc., and gives readings in terms of ohms, which is a most useful index for fault location.

The ohmmeter consists essentially of a low-voltage direct-current voltmeter connected in series with two flashlight dry cells and having a pair of flexible leads with test clips for use in connecting to the circuits to be tested. As the name implies, an ohmmeter is a resistance measuring device.

Theory of the "Ohmmeter."

The ohmmeter functions in exactly the same manner as the office "voltmeter test panel" which is available in most offices for line measurements, etc. A wire chief or troubleman is enabled to virtually take the "wire-chief's voltmeter" wherever he goes, thus enabling quick and accurate fault location in circuits and apparatus.

Referring to Fig. 1 it will be noted that in testing through an external circuit the current from the dry cells flows through the meter and through the external circuit in series. It is obvious that the greater the resistance in the external circuit, the less the current flow through the voltmeter and hence a lower reading.

With zero resistance in the external circuit the voltmeter would give a full scale deflection. If we now mark this point down as 3 volts = 0 ohms, then as the resistance increases in the external circuit, we can also mark down other voltmeter readings which indicate the resistance in the external circuit. For instance, assume the resistance of the voltmeter coil is 300 ohms, then if we cut in 300 ohms in the external circuit, we would obtain a reading of only 1.5 volts. This we could mark down as 1.5 volts = 300 ohms. It is apparent that every voltmeter reading indicates a corresponding resistance which, connected in series with the meter and dry cells, will give this reading.

There are two ways in which we calibrate our "ohmmeter." We can, if we have access to a decade resistance box or to a Wheatstone bridge, connect variable known resistances in the external circuit of our meter and adjust these variable resistances, so as to get voltmeter readings and corresponding resistance readings for all of the dial divisions. These can then be arranged on a small print

(Over)

connected to two small flashlight cells, it will read any resistance from zero to 10,000 ohms. This meter is known as Model 506, Type 538-J. The dial has two scales, one reading in ohms and the other in volts.

Constructional Details.

Fig. 1 shows the schematic wiring of the "ohmmeter." The meter should be either the Weston model 506 or any good three-volt direct current meter.

Several different styles of carrying case may be used. In general, it is a good idea to make the case small enough to fit in the coat pocket so that the instrument will be convenient to carry.

One suggestion is to drill out a piece of 2-inch by 3½-inch by 5-inch oak so that it will contain the two flashlight dry cells, and the meter. If carefully arranged, Fig. 2, an excellent appearing case can thus be made. A switch should be provided for throwing the negative test lead around the battery circuit so as to permit using the 3-volt scale for voltmeter readings.

Connection to the dry cells can be made by some manner of pressure contact similar to that in a flashlight case, or preferably by means of flexible leads soldered to the cells.

The cells should be replaced about once a month to insure that the full three volts are always available. However, if the meter is not used to a large extent it can be checked by short-circuiting the test leads, and the battery replaced only when a reading indicates a falling off in voltage.

Note: Uses of "ohmmeter" will be discussed in another data sheet.

Resistance Measuring Range of Ohmmeter.

The resistance measuring range of any direct current voltmeter arranged in the ohmmeter circuit just described can be found from the formula given. It is evident from the formula that the higher the resistance of the voltmeter, the greater will be the overall range of the instrument, but the larger will be the change in resistance between adjacent scale divisions. If readings within an ohm or so of the correct value are desired, as when testing line wire, etc., then a low resistance meter should be used.

Where a meter with sufficiently low resistance to give the desired range cannot be obtained, then a direct current milliammeter with a series resistance can be used. For example, a milliammeter with a range of 0 to 30 milliamperes, when used with an external resistance sufficient to bring the total circuit resistance up to 50 ohms, will just give a full scale deflection on 1½ volts.

In other words, we have a 1½-volt voltmeter with a resistance of 50 ohms. By substituting in the formula, we find that such a meter will have a range when used as an ohmmeter of 0 to 1,450 ohms and with fairly small steps at the higher end of the scale.

Inductive Interference Notes.

General.

When telephone and power lines parallel each other for any distance, "power noise" may be set up in the telephone lines as a result of the induction from the electro-static and electro-magnetic fields of the power lines. The magnitude of the induced power noise will depend upon the length of parallel, separation between communication and power line, electrical balance of each line, and the voltage and current of the power line.

On parallels involving voltages greater than 2,300 and distances of one-half mile or longer, some remedial measures will usually be required. The induced noise can generally be kept at a negligible amount, if an adequate power and telephone line transposition schemes are placed.

Reduction of Power Noise by Transpositions.

There are two types of induction to consider in power-telephone line parallels. One is known as "transverse induction" and represents the voltage induced between the two telephone wires (electric), or the difference of induced voltage along the two conductors (magnetic); and the other as "longitudinal induction," which is the induced voltage of the two telephone conductors to ground (electric) or along the telephone conductors (magnetic).

An understanding of these two types of induction can best be obtained by thinking of the transverse voltage induced on the telephone line as the voltage reading obtained if a voltmeter is connected across the telephone line wires; and the logitudinal voltage as the reading obtained when a voltmeter is connected from either of the telephone wires to ground.

These two types of induction act in different ways. The transverse induction will create the greatest amount of noise in telephone circuits under ordinary circumstances, although longitudinal voltages will set up large circulating noise currents if the telephone line is unbalanced. If telephone lines could be perfectly balanced (series resistance and leakage and susceptance to ground the same), no noise currents could be set up even though a high longitudinal voltage might be induced on the two line wires.

Transpositions in the telephone line, if properly placed, will reduce the transverse induced voltage to a negligible amount and transpositions in the power line, if properly placed will reduce both the transverse and longitudinal voltages (from balanced currents and voltages in the power line) on the telephone line to a small amount. The ideal transposition arrangement is one which reduces both transverse and longitudinal voltages to a zero value.

Because of the necessity for having transpositions in telephone lines to reduce crosstalk, it is usually not practicable to utilize power line transpositions for both transverse and longitudinal balance. Another reason which makes this impractical is the necessity for balancing the telephone wire

(Over)

attached to the ohmmeter case so that any voltmeter reading can be quickly converted into ohms. An easier method is to compute by means of a formula the resistance which, if connected in the external circuit, would give the various dial readings possible.

This formula is:

$$R_x = \frac{(E-E_v)}{E_v} \times R_v$$

where R_x = unknown resistance, E = battery voltage, E_v = voltmeter reading, and R_v voltmeter resistance.

This formula, of course, requires that the resistance of the voltmeter be known. This can be determined by measurements on a Wheatstone bridge, or if a sensitive milliammeter (range about 0 to 25) is available, by noting the current flow when the voltmeter is connected to a new dry cell (1.5 volts) in series with the milliammeter, and dividing the cell voltage (1.5) by the current-flow reading as indicated on the milliammeter, i. e.: $R = E/I$.

A still easier and better method is to purchase outright a meter already calibrated in ohms, thus saving not only the necessity for the initial calibration but doing away with the need for referring to a conversion table.

The Weston Electrical Instrument Co. recently put on the market a meter that is ideal for this purpose. When

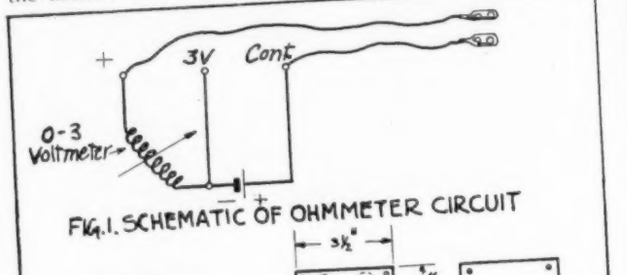


FIG. 1. SCHEMATIC OF OHMMETER CIRCUIT

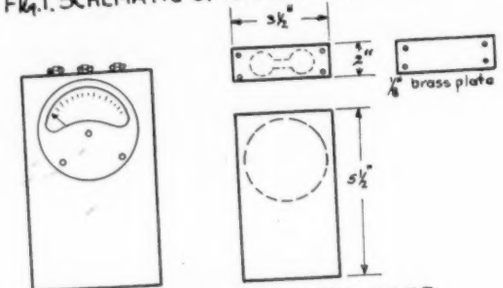


FIG. 2. DETAILS OF OHMMETER CASE.

Is your office receiving enough copies?

MANY telephone organizations, including some of the largest companies, have arranged with TELEPHONY to supply them with additional copies of the paper each week so that all employees may acquire an individual handbook of engineering data.

Company after company has written—ordering binders—wanting additional copies of TELEPHONY so that every man in the organization can have his own.

"An excellent idea" says one man whose successful company is known to all telephone people. "It's the best thing you can do for the man in operating telephony," writes another.

TELEPHONY prints articles and news that is of immeasurable value to every single person associated with the telephone business. With the publication of the engineering data sheets, it is important that every operating man in your organization has his personal copy of TELEPHONY. A handbook will assist him and you in your endeavor to render better telephone service.

Order your additional TELEPHONY subscriptions today!

Telephony

608 S. Dearborn CHICAGO

Telephony's Engineering Data.
By B. C. Burden.

capacities to ground (desirable for keeping noise at a minimum) and this, of course, requires transpositions. For example, the wires on the end pins on a crossarm would have a smaller capacity to earth than would the wires on other pin positions, unless they are transposed.

Inductive parallels generally require that the telephone line be transposed so as to obtain transverse balance; and the power line so as to obtain longitudinal balance. This results in what is referred to as a "coordinated transposition scheme," meaning that the transpositions in each class of line are placed with due regard to those in the other line.

The principal requirements of a "coordinated transposition scheme" are as follows:

1. The power line should be balanced to ground by barrelling.
2. Power barrels should not be longer than six miles (generally speaking) and preferably three miles where possible. (Three phase.)
3. Transpositions in the power line should fall opposite neutral points in the telephone line (transposition balance points).
4. The transpositions in each class of line should be so arranged as to give as near 100 per cent longitudinal and transverse balance as possible.

Fig. 1 illustrates how crosstalk, and transverse and longitudinal power induction are all balanced out by means of a coordinated transposition scheme. The parallel is a three-phase power line and two non-phantomed telephone cir-

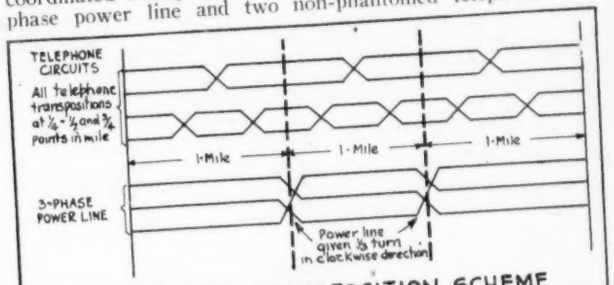

TELEPHONE CIRCUITS
All telephone transpositions at ¼ - ½ and ¾ points in mile
1-Mile
1-Mile
1-Mile
3-PHASE POWER LINE
Power line given ⅓ turn in clockwise direction

FIG. 1. CO-ORDINATED TRANSPOSITION SCHEME

cuits. The length of the parallel is three miles. A study of this disagram will bring out what is meant by "locating power transpositions opposite neutral points" in the telephone transposition scheme.

If induced power noise is to be kept at a minimum, the power wires must be balanced to ground outside the parallel as well as within. A single-phase power line is inherently balanced to ground (horizontal configuration) but a three-phase line will require barrelling.

WHAT THE COMMISSIONS ARE DOING.

(*Concluded from page 42*)

vice, which will require the construction of new lines.

The Pine Lake company was authorized to discontinue its old rates of $2 per month for all telephones, and substitute the following rates: Business, party line, $2.50 per month; business, private line, $4 per month, and residence, party line, $2 per month.

Wisconsin Commission Approves General Rates Requested.

The Crawford County Telephone Co. of Soldiers Grove, Wis., will adopt new rates for its general lines as approved by the Wisconsin Railroad Commission. The Crawford County company was recently organized and takes the place of a company poorly-organized and the records of which are of practically no value in checking the cost of operation of the new organization. The lines connected to the various exchanges of the old organization were in very poor shape and the service poor. Subscribers on rural lines furnished their own telephones.

The Crawford County company, since taking over the old company, has expended considerable sums in rehabilitating the lines in order to give better service to the subscribers. The commission found the proposed new rates justifiable, and the schedule will be adopted, with a few exceptions, until some future time when the records of the company might show that some modification should be made.

The commission did not approve the proposed rate of $8 gross and $7.50 net for new subscribers requiring construction of new line in excess of one-half mile for each new subscriber; and ordered that no service should be discontinued for non-payment of bills until five days after written notice.

It was further ordered that extension of lines should be made, only on contract for two years' service, to the extent of one-half mile per subscriber at the expense of the company; extensions in excess of the free limit will be carried by the subscriber. For each additional subscriber added to extensions, parties who have paid amounts to help finance construction shall receive refunds, in an amount equal to the cost of one-half mile of line less the cost of any extension to serve an additional subscriber.

The new net rates which are payable quarterly in advance are:

Business, one party line, $6; residence, one party line, $5; residence, urban party line, including platted portion of villages, $3; residence, rural party lines, $4, and business, rural party lines, $5.

The new rates approved by the commission will go into effect at the next billing period and the present existing rates will be discontinued.

Making the Hills in High!

Some enterprises go sailing along, geared in high, never shifting for the grades. That's because the man at the wheel has taken care of the motor. The services of the public utilities department of the United Trust Company, to the Independent telephone executive, are like those offered by the efficient mechanic to the motorist. Our executives have had 30 years' experience in utilities operation. They offer expert assistance in financing, advertising, bookkeeping, taxation, appraisals and engineering.

PUBLIC UTILITIES DEPARTMENT

The United Trust Company

ABILENE, KANSAS

Fill in and mail the coupon below today and get our free book "A Complete Service."

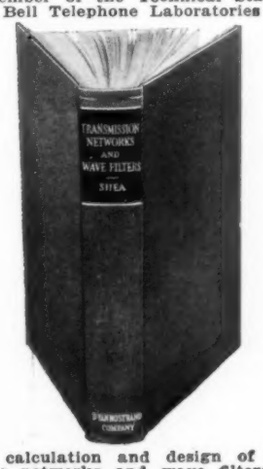
Name .....

Firm Name .....

Address .....

Transmission Networks and Wave Filters

By T. E. SHEA, B. S., M. S.
Member of the Technical Staff, Bell Telephone Laboratories



The calculation and design of telephone networks and wave filters are fully presented in this book, written by Mr. T. E. Shea of Bell Telephone Laboratories. It embodies the most recent developments in this field as well as the standard practice. "The Telephone Equipment of 1929," "The New Science Telephony," "Transmission Networks and Wave Filters" and "Radio Broadcasting Engineering" are a few of the subjects capably discussed in this valuable book.

Send for This Book Today!
We recommend it as of great interest and value to every telephone man.
512 Pages—6¼x9¼—Cloth—Illustrated —$6.50

TELEPHONY PUBLISHING CORP.
608 S. Dearborn St. Chicago, Ill.
Telephone—Wabash 8604

NEW PIONEER
"Mastre" Pulling Grip
Type "M"

The last word in CABLE GRIPS.

Equipped with SOLID STEEL EQUALIZING LUG giving UNIVERSAL FLEXIBILITY to the strands of the GRIP at any angle pulling around bends or uneven conduits.

The NEW FLEXIBLE STEEL BEAD PROTECTION gives entirely NEW WEARING SURFACES by ROTATING same on the shoulder of the GRIP. This GRIP is guaranteed to OUTWEAR a dozen ordinary old type Grips.

Write us for 1930 descriptive matter and CATALOG on all kinds of CABLE GRIPS.

Pat. Oct. 1, 1929 Ser. No. 1,730,155

MARTIN & SON PRO. CO., Inc.
9 Ardsley Ct.
NEWARK, N. J.

Summary of Commission Rulings and Schedule of Hearings.

INTERSTATE COMMERCE COMMISSION.

July 3: Order issued approving the acquisition by the Chesapeake & Potomac Telephone Co. of Virginia, of control of the Petersburg Telephone Co., Petersburg, Va., by purchase of capital stock.

ARKANSAS.

July 18: Hearing at Mena on petition of residents of Vandervoort and Hatfield for a reduction of the rates charged rural subscribers by the Three States Telephone Co., whose headquarters are in Dallas, Texas.

CALIFORNIA.

July 16: Application filed by G. F. Green for authority to sell and J. T. Shipley to purchase the Ripon Telephone Exchange in the town of Ripon, San Joaquin county. J. T. Shipley asks that, in the event he is authorized to acquire the telephone property, he be permitted to issue his notes in the aggregate sum of $12,000 and to execute a mortgage on the telephone property to secure payment of the notes issued.

ILLINOIS.

July 22: Hearing at Springfield on proposed advance in rates by the Cowden Mutual Telephone Co. for toll service from Cowden to Shelbyville and other points, stated in rate schedule I. C. C. No. 3, sheet 3, filed by the company.

July 22: Hearing at Springfield before Commissioner Gilbert on proposed advance in rates by the Lakewood Mutual Telephone Co. for toll service in Lakewood and vicinity, Coles County, stated in rate schedule I. C. C. No. 4, sheet, 2, of the company.

July 22: Hearing at Springfield before Commissioner Gilbert on proposed advance in rates by the Sparta Telephone Co. for service in Sparta, stated in rate schedule I. C. C. No. 5, of the company.

July 22: Hearing at Springfield before Commissioner Gilbert on proposed advance in rates by the Illinois Southeastern Telephone Co. for toll service from Shelbyville to Findlay, Windsor, Strasburg, Stewardson, Sigel, Shumway, Cowden, Beecher City, Herrick, Moweaqua, Neoga and Trowbridge; from Tower Hill to Mode, Westervelt, Findlay, Windsor, Strasburg, Stewardson, Cowden and Herrick; Humbolt to Charleston, and from Charleston to rural subscribers, stated in rate schedule I. C. C. No. 2, filed by the company.

July 22: Hearing at Springfield before Commissioner Wilson on proposed advance in rates by the Stewardson Telephone Co. for toll service in Stewardson and vicinity, stated in rate schedule I. C. C. 2, revised sheet 3 of the company.

July 23: Continued hearing at Springfield before Commissioner Kuhn on application for approval of contract made and entered into on January 2, 1926, between the Geneseo Co-operative Telephone Co. and the Geneseo Mutual Exchange, covering switching service in Geneseo and vicinity.

INDIANA.

July 11: A petition of the Northern Indiana Telephone Co. of North Manchester to increase rates and to establish free service between certain exchanges denied. The towns involved were North Manchester, Akron, Bourbon, Mentone, Atwood, Bippus, Burket, Claypool, Etna, Green, Fulton, Macy, Sidney, Silver Lake, and Millwood.

July 11: St. Joseph County Telephone Co. applied for authority to increase rates at North Liberty, Walkerton, New Carlisle and Lakeville.

July 14: Argument heard on petition to increase rates at 29 exchanges of the Southern Indiana Telephone & Telegraph Co. Approximately 30 representatives of south central Indiana towns affected attended the hearing. Attorneys for the company contended rates at many exchanges involved were discriminatory and at other exchanges were too low to allow expenditures for proper service.

July 15: Petition filed by Pulaski County Telephone Corp. to increase rates at Winamac, Monterey, Kewanna, Grass Creek, Francesville, Medaryville and Leiters Ford. Present rates are too low to return a fair income on the company's investment, the petition states.

July 15: Petition filed by the Home Telephone & Telegraph Co. of Fort Wayne, asking authority to issue $500,000 common capital stock. Funds derived from the sale would be used to reimburse the treasury for expenses incurred in improvements over a period of some months.

July 29: Hearing at Franklin on petition of the Johnson County Telephone Co., for permission to increase its rates at Franklin, Bargersville, Trafalgar, Whiteland, Nineveh, and Marietta. The petition declares that the present rates are not sufficient to pay operating expenses, depreciation, and a fair return of the property; that the operating revenue is insufficient to pay the cost of installing new equipment to better the service. The Johnson County company is owned by the Interstate Telephone & Telegraph Co., of Indianapolis.

KANSAS.

July 3: Application filed by the Southwestern Bell Telephone for authority to increase its rates at Augusta to cover a change from magneto to common battery

The proposed new rates are: Business, $3.50 per month and $1.75 for extensions: one-party residential, $2.25; four-party $1.75; residential extension, 75 cents.

July 28: Hearing at Topeka on application of the Burrton & Buhler Telephone Co. of Burrton, for a certificate relating to a proposed issue of its first mortgage gold bonds in the amount of $5,000.

August 7: Hearing at Kimbal on application of the Kimbal Telephone Exchange for permission to sell its plant and property at Kimbal.

August 7: Hearing at Kimbal on application of Claude Cockayne, for permission to make certain changes in rates for service at Kimbal.

August 7: Hearing at Kimbal on application of Claude Cockayne for a certificate of convenience and authority to transact the business of a telephone exchange at Kimbal and surrounding territory.

August 19: Hearing at Topeka on complaint of the Lansing Telephone Co, of Lansing, against the Southwestern Bell Telephone Co.

August 20: Hearing at Osawatomie on application of the Kansas Telephone Co. for permission to discontinue its exchange at Beagle, and for authority to serve the present subscribers of the Beagle exchange direct from its exchange at Osawatomie.

August 20: Hearing at Rantoul on ap-

POPULARITY THAT LASTS!

No. 79 Quart
No. 80 Pint
Gasoline--Kerosene
Covered by Patents

Whenever you see a telephone man at work, you can always be sure that with his tools, you will find an "ALWAYS RELIABLE" torch or furnace.

Because of their dependability, these torches and furnaces have become favorites among telephone men.

Order through your distributor or mail your order to us with your distributor's name.

OTTO BERNZ CO., INC.
NEWARK NEW JERSEY

Creosoted Wood Conduit
Railroad Ties, Bridge Timbers, Piles, Poles, Paving Blocks and Lumber—Manufacturers of Cross Arms, Signal Trunking and Wyckoff Conduit for Underground Wires.
The Wyckoff Pipe & Creosoting Company
Established 1881
OFFICE: 522 5th Ave., N. Y. WORKS: Portsmouth, Va.

EVER-PROTECT CABLE COMPOUND
EFFECTIVE *in maintaining your underground and aerial cable in perfect condition*
NATIONAL CABLE COMPOUND CO.
MITCHELL INC. INDIANA

RAY-O-VAC
TELEPHONE BATTERIES
FRENCH BATTERY COMPANY
Factory: Madison, Wis. *Sales Office:* 20 North Wacker Drive, Chicago

It is a mark of distinction to say, "I saw it in TELEPHONY."

OPPORTUNITIES!

Rates 10 cents per word, payable in advance. Minimum charge $2.00 for 20 words or less.

"REBUILT" TELEPHONE APPARATUS

and exchange equipment saves you 30 to 50 per cent—quality and efficiency guaranteed.

EVERYTHING YOU NEED

for the installation and operation of a complete exchange—Magneto or Central Energy.

TWENTY YEARS' SUCCESSFUL OPERATION

of our "Rebuilt" Equipment Department puts it past the experimental stage. **Ask for our Free No. 78 Bargain Bulletin.**

ADDRESS

"Rebuilt" Equipment Department

Premier Electric Company

Chicago, Ill.

"REBUILT" when connected with PREMIER means something.

RECONSTRUCTED EQUIPMENT

Holtzer-Cabot 1600 ohm Non self-contained ringers	1.00
Chicago Tel. Supply Co. 50 line capacity magneto Swbd. equipped with 25 self restoring combine line drops and jacks and 10 complete cord Ckts. with ring back keys @	125.00
Kellogg No. 97 C. B. desk sets complete with straight line steel signal sets @	$ 7.00
Kellogg No. 30A combine line drops and jacks, per strip of 10 @	11.50
Monarch 100 ohm combine line drops and jacks, per strip of 5	6.75
Kellogg No. 301A combine line drops and jacks, per strip of 5 @	7.50
Western Elec. No. 293 C. B. Straight line wood hotel sets @	6.75
Stromberg or Leich Local Battery transmitters with mouthpiece @	1.00
Reliable Elec. 1 amp Wood Fuses, same as Cook No. A7. Distance between shoulders 4¾ inches, per 100	3.50

Write for Bulletins

REBUILT ELECTRIC EQUIPMENT CO.
1940 West 21st Str., Pilsen Station, Chicago, Ill.

HAVE YOU ANY OLD TELEPHONE EQUIPMENT TO BUY OR SELL?

Then try the "Opportunities" page in TELEPHONY for it will give you quick and pleasing results, as the following letter from the Manteca Telephone Co., Manteca, Calif., testifies:

"Enclosed please find check in payment of invoice for classified advertisement. Had fine results from the advertisement as is usual in good old TELEPHONY."

We receive many similar letters every day.

WHY DON'T YOU GIVE IT A TRIAL?

TELEPHONES repaired and exchanged. New and slightly used equipment for sale. Telephone properties listed for sale. Send for Price List and sample mouth-pieces.

TELEPHONE REPAIR SHOP
1760 Lunt Ave., Chicago, Ill.

FOR SALE

FOR SALE—Two private Automatic Electric Co.'s switchboards complete, wired for 40 lines each. Can be seen in operation. Any reasonable offer accepted. Address 7800, care of TELEPHONY.

FOR SALE—"Wireless" Cable Testers, new, guaranteed, $18.50. Why pay more? Electric Specialty Co., Box 645, Cedar Rapids, Iowa.

WANTED

WANTED—Man for general telephone work, including trouble. Must have had satisfactory experience and preferably cable work. Latter not necessary. Give references and experience with application. Address 7790, care of TELEPHONY.

STROMBERG-CARLSON

SWITCHBOARD PARTS

S. C. No. 4 drops complete	$ .75
S. C. No. 4 drop coils only	.35
S. C. No. 11-A repeating coils	2.00
S. C. No. 13-A repeating coils	2.10
S. C. No. 12-A repeating coils	4.00
S. C. No. 17-A impedance coils	1.90
S. C. No. 19 2-MF condensers	.50
S. C. No. 6 cord weights	.20
S. C. No. 2-C operators' breast plate sets	5.00

No. 190 and 200 type relays.
(prices on request)

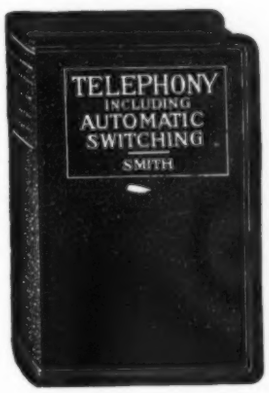
Buckeye Telephone & Supply Company
1432 So. Parsons Ave.,
COLUMBUS, OHIO

POSITIONS WANTED

POSITION WANTED — Experienced Chief Operator wants smaller town. Experienced in operating, bookkeeping and collections. Best reference by employers and subscribers. Address 7789, care of TELEPHONY.

POSITION WANTED:—Combination Wire Chief and Lineman for magneto or common battery. Ten years' experience exchanges of 300 to 15,000 subscribers. Address 7781, care of TELEPHONY.

TO OBTAIN the *Right Man* for your requirements, an "Opportunity's" advertisement will place him in touch with you.



If a man is to succeed in the business world today he must be "worthy of his hire."

So it is with books. They also must give the reader his money's worth.

In offering "Telephony, Including Automatic Switching," for sale, its publishers have arranged an excellent collection of helpful information and data fully illustrated and up-to-date for the telephone man.

TELEPHONY, including AUTOMATIC SWITCHING, is written by Arthur Bessey Smith, E. E. Automatic switching is certainly being rapidly adopted, and the construction of every switch, relay and contractor in the whole range of automatic devices is clearly presentable.

Pocket size, bound in Leatherette, Gold Stamping, 500 pages, 268 illustrations and Wiring Diagrams. Price $2.50.

TELEPHONY PUBLISHING CORP.
608 So. Dearborn St., Chicago
Telephone—Wabash 8604

Valuation—Supervision—Plant—Inductive Interference
Expert Administrative Counsel for Utilities
JAY G. MITCHELL
TELEPHONE ENGINEER
Member A. I. E. E.
Member W. S. E.
1509 South Park Ave., Springfield, Ill.

Frank F. Fowle & Co.
Electrical and Mechanical
ENGINEERS
221 North La Salle St. CHICAGO

CONSULTING
Telephone Engineer
GARRISON BABCOCK
Tel. E. L. 3149 503 White Building
SEATTLE WASHINGTON

SPOONER & MERRILL, Inc.
CONSULTING ENGINEERS
Specialists in Public Utilities
TELEPHONE - ELECTRIC - GAS
WATER - RAILWAY
Valuation—Examinations—Engineering
CHICAGO, ILLINOIS
20 No. Wacker Drive

J. K. JOHNSTON
TELEPHONE
JJK
ENGINEER
INDIANAPOLIS
During recent years I have been privileged to appraise Telephone Exchanges all over the United States. The list totals 750. Would you like to avail yourself of my services?
1035-6 Lemcke Building

CONSULTING TELEPHONE ENGINEERS
W. C. POLK J. W. WOPAT
Plans, Estimates and Reports, Appraisal and Supervision
Can arrange a moderate amount of financing
406 W. 34th St. Kansas City, Mo.

W. H. CRUMB
Telephone Engineer
9 South Clinton St. Chicago

J. G. WRAY & CO.
Telephone Engineers
Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization, and Operation of Telephone Companies
J. G. Wray, Fellow A. I. E. E.
Cyrus G. Hill
2130 Bankers Bldg., Chicago

plication of the Kansas Telephone Co. for permission to make certain changes in its rates for service at Rantoul.

MINNESOTA.

July 19: The Middle River Telephone Co., of Middle River, granted permission to increase its rates, effective August 1.

August 1: Hearings at Lewiston and Rollingstone on application of the Winona County Telephone Co. for authority to change its rates for business, residence, and rural service, and to establish certain special charges for installations, removals, and other service at its Lewiston, Rollingstone, and Altura exchanges.

NEBRASKA.

July 15: Application filed by Lincoln Telephone & Telegraph Co. for authority to discontinue a grounded rural service rate of $1.35 at its Ashland exchange and a similar service rate of $1.25 at its Nora exchange; no demand remains for such service.

July 15: Application filed by Lincoln Telephone & Telegraph Co. for authority to charge an additional rate of 50 cents a month for rural business, where the line is limited to a maximum number of six subscribers; found reasonable and granted as requested.

July 15: In the matter of the application of the Lincoln Telephone & Telegraph Co. for authority to cancel grounded rates of $1.60 for rural service at its Superior exchange and of $1.50 at its Gilead exchange; it appearing that this service is no longer demanded or offered, request granted as asked.

July 15: In the matter of the application of the Lincoln Telephone & Telegraph Co. for validation of four-party rate at its Steele City exchange; it appearing that the rate is an inheritance from former ownership, and that its publication and collection without authority are the result of mistake and error, request granted as asked.

OHIO.

July 17: New advanced rate schedule approved for the Buckeye Lake Home Telephone Co., operating in Baltimore, Millersport, Pleasantville, Thurston, and Buckeye Lake. The rate schedule is effective as of July 16, 1928, as the company has been collecting the new rates under bond since that date. The bond is now released.

OKLAHOMA.

July 18: Hearing on complaint of the Oklahoma Rural Telephone Co. against the Western Telephone Corp. for restoration of free service between Douglas and Marshall.

WISCONSIN.

July 12: Order issued approving new rate schedule for the Crawford County Telephone Co., of Soldiers Grove; new rates to go into effect on the company's next billing period.

July 19: Approval given new rate schedule for the Pine Lake Rural Telephone Co., of Rhinelander. The new rates are effective August 1.

August 4: Hearings at Madison on applications of the Fond du Lac Rural Telephone Co., Oakfield Telephone Co., Random Lake Telephone Co., Eden Telephone Co., and Cascade Telephone Co., for permission to dissolve.

The companies are now controlled by the Mid-Continent Telephone Co. and it is reported they are to be re-incorporated under the name of the Theresa Union Telephone Co., of Fond du Lac, which is also operated by the Mid-Continent company.

August 8: Hearing on application of the Wild Rose Telephone Co., Wild Rose, for permission to dissolve.

Western Telephone Directory Co.
A Telephone Directory Advertising Sales Organization
Main Office: Telephone Bldg., Kansas City, Mo.
Wichita, Kan. 816 Brown Bldg.
Chicago 100 W. Monroe

ACCOUNTING
HERDRICH AND BOGGS
Certified Public Accountants
Specializing on Public Utilities
901-7 Continental Bank Bldg.
Indianapolis, Indiana

Universal Insulators
will support your drop wires to your entire satisfaction and at a minimum cost. Are you a user? Samples free on request.
Universal Specialty Co.
711 Poplar Street
Terre Haute, Ind.

Creosoted
CEDAR POLES
Prompt Shipment via Rail or Water
CASCADE TIMBER CO.
822 Tacoma Building Tacoma, Wash.

NILCO
SWITCHBOARD LAMPS
NILCO LAMP WORKS, INC., Emporium, Pennsylvania

Republic Appraisal Company, Inc.
Seaborn N. Vines, Pres.
John C. Larkin, Vice-Pres.
Specialists in valuation, engineering, management and accounting for telephone properties.
General Offices:
Chamber of Commerce Bldg.
Syracuse, N. Y.

NAUGLE POLES
Northern and Western Cedar
Butt-treated or Plain
NAUGLE POLE & TIE CO.
59 East Madison St., Chicago

The advertisers on this page will render you prompt, efficient service